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MEMORANDUM REPORT NO. 1864

SPIW MODES OF FIRE (U)

by

I. J. W. Hall, Jr.
William W. Sheldon
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MAR 28 1968

February 1968

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MEMORANDUM REPORT NO. 1864

FEBRUARY 1968

SPIW MODES OF FIRE (U)

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Interior Ballistics Laboratory

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MEMORANDUM REPORT NO. 1864

FWHall, Jr./WWSheeldon/
WMWerner/EMWineholt/sjw
Aberdeen Proving Ground, Md.
February 1968

SPIW MODES OF FIRE (U)

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ABSTRACT

A study was made to investigate the most effective mode of aimed fire to engage linear and point targets with the rifle portion of the Special Purpose Individual Weapon (SPIW) system. Basic test data were generated by a group of riflemen firing a total of approximately 23,000 rounds at different types of simulated targets on the range facilities at Fort Benning, Georgia. A supplementary phase discussed in this report is the applicability to the SPIW of doctrine evolved for full automatic fire from other rifle systems.

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TABLE OF CONTENTS

	Page
ABSTRACT	3
LIST OF ILLUSTRATIONS	7
LIST OF TABLES	11
LIST OF SYMBOLS	13
GLOSSARY	14
I. INTRODUCTION	15
II. SUMMARY OF PRESENT DOCTRINE	17
III. TEST PLAN	19
IV. TEST RESULTS	21
V. TEST RESULTS AND PRESENT DOCTRINE	35
VI. CONCLUSIONS	37
 APPENDIXES	
A - FACILITIES	41
B - PROCEDURES	47
C - TABLES OF DATA	65
D - TARGET PHOTOGRAPHS	115
DISTRIBUTION LIST	157

Figure	Page
1 Controlled burst, point target, standing, Firer No. 1 . . . 23	
2 Full automatic, point target, standing, Firer No. 1 . . . 23	
3 Controlled burst, sweep target, standing, Firer No. 1 . . . 23	
4 Full automatic, sweep target, standing, Firer No. 1 . . . 24	
5 Controlled burst, sweep target, standing, one trial of Firers 1 through 5 26	
6 Full automatic, sweep target, standing, one trial of Firers 1 through 5 26	
7 Controlled burst, calibration target, standing 27	
8 Controlled burst, sweep target, standing 28	
9 Full automatic, sweep target, standing 28	
10 Controlled burst, point target, standing 28	
11 Full automatic, point target, standing 28	
12 Target area projected onto a target panel 29	
13 Zone of consideration, sweep target computer simulation . 30	
14 Ratio of hit probability, full automatic to controlled burst versus range 31	
15 Ratio of the projectile impacts within the target area versus range, full-automatic to controlled-burst modes 33	
1A Verification test range 41	
2A Sample target 42	
3A Pseudo-tactical range 43	
4A Silhouette target array 43	
5A Pseudo-tactical firing position 44	
6A AAIC weapon 45	
1B Calibration target 47	
2B Sweep target 48	
3B Point target 48	
4B Standing position 51	
5B Prone position 52	
6B Supported position 55	
7B Layout of Tables IV through VIII 61	
8B Layout of Tables IX through XIII 62	

LIST OF ILLUSTRATIONS (Continued)

Figure	Page
1D Calibration, controlled burst, standing, Firer No. 1 . .	117
2D Calibration, controlled burst, standing, Firer No. 2 . .	117
3D Calibration, controlled burst, standing, Firer No. 3 . .	118
4D Calibration, controlled burst, standing, Firer No. 4 . .	118
5D Calibration, controlled burst, standing, Firer No. 5 . .	119
6D Calibration, controlled burst, standing, Firer No. 6 . .	119
7D Calibration, controlled burst, standing, Firer No. 7 . .	120
8D Calibration, controlled burst, standing, Firer No. 8 . .	120
9D Calibration, controlled burst, standing, Firer No. 9 . .	121
10D Calibration, controlled burst, standing, Firer No. 10 . .	121
11D Calibration, controlled burst, standing, Firer No. 11 . .	122
12D Controlled burst, sweep target, standing, Firer No. 1 . .	122
13D Controlled burst, sweep target, standing, Firer No. 2 . .	123
14D Controlled burst, sweep target, standing, Firer No. 3 . .	123
15D Controlled burst, sweep target, standing, Firer No. 4 . .	124
16D Controlled burst, sweep target, standing, Firer No. 5 . .	124
17D Controlled burst, sweep target, standing, Firer No. 6 . .	125
18D Controlled burst, sweep target, standing, Firer No. 7 . .	125
19D Controlled burst, sweep target, standing, Firer No. 8 . .	126
20D Controlled burst, sweep target, standing, Firer No. 9 . .	126
21D Controlled burst, sweep target, standing, Firer No. 10 . .	127
22D Controlled burst, sweep target, standing, Firer No. 11 . .	127
23D Full automatic, sweep target, standing, Firer No. 1 . .	128
24D Full automatic, sweep target, standing, Firer No. 2 . .	128
25D Full automatic, sweep target, standing, Firer No. 3 . .	129
26D Full automatic, sweep target, standing, Firer No. 4 . .	129
27D Full automatic, sweep target, standing, Firer No. 5 . .	130
28D Full automatic, sweep target, standing, Firer No. 6 . .	130
29D Full automatic, sweep target, standing, Firer No. 7 . .	131
30D Full automatic, sweep target, standing, Firer No. 8 . .	131
31D Full automatic, sweep target, standing, Firer No. 9 . .	132

LIST OF ILLUSTRATIONS (Continued)

Figure	Page
32D	Full automatic, sweep target, standing, Firer No. 10 . . 132
33D	Full automatic, sweep target, standing, Firer No. 11 . . 133
34D	Controlled burst, point target, standing, Firer No. 1 . . 134
35D	Controlled burst, point target, standing, Firer No. 2 . . 135
36D	Controlled burst, point target, standing, Firer No. 3 . . 136
37D	Controlled burst, point target, standing, Firer No. 4 . . 137
38D	Controlled burst, point target, standing, Firer No. 5 . . 138
39D	Controlled burst, point target, standing, Firer No. 6 . . 139
40D	Controlled burst, point target, standing, Firer No. 7 . . 140
41D	Controlled burst, point target, standing, Firer No. 8 . . 141
42D	Controlled burst, point target, standing, Firer No. 9 . . 142
43D	Controlled burst, point target, standing, Firer No. 10 . . 143
44D	Controlled burst, point target, standing, Firer No. 11 . . 144
45D	Full automatic, point target, standing, Firer No. 1 . . . 145
46D	Full automatic, point target, standing, Firer No. 2 . . . 146
47D	Full automatic, point target, standing, Firer No. 3 . . . 147
48D	Full automatic, point target, standing, Firer No. 4 . . . 148
49D	Full automatic, point target, standing, Firer No. 5 . . . 149
50D	Full automatic, point target, standing, Firer No. 6 . . . 150
51D	Full automatic, point target, standing, Firer No. 7 . . . 151
52D	Full automatic, point target, standing, Firer No. 8 . . . 152
53D	Full automatic, point target, standing, Firer No. 9 . . . 153
54D	Full automatic, point target, standing, Firer No. 10 . . 154
55D	Full automatic, point target, standing, Firer No. 11 . . 155

The following page is blank.

(UNCLASSIFIED)

LIST OF TABLES

	Page
I. Percentage of Multiple Hits Versus Range	32
II. Pseudo-Tactical Summary Sheet	34
III. Ammunition Data	46
IV. Miss Distance, Calibration, Standing	67
V. Miss Distance, Sweep, Controlled Burst, Standing	71
VI. Miss Distance, Sweep, Full Automatic, Standing	75
VII. Miss Distance, Point, Controlled Burst, Standing	79
VIII. Miss Distance, Point, Full Automatic, Standing	83
IX. Measures of Dispersion, Calibration, Standing	87
X. Measures of Dispersion, Sweep, Controlled Burst, Standing	89
XI. Measures of Dispersion, Sweep, Full Automatic, Standing . .	91
XII. Measures of Dispersion, Point, Controlled Burst, Standing	93
XIII. Measures of Dispersion, Point, Full Automatic, Standing .	95
XIV. Summary Across Men, Measures of Dispersion	97
XV. Extreme Spread, Calibration, Controlled Burst, Standing, November 1966	98
XVI. Extreme Spread, Three-Round Burst, Low and High Rate of Fire, Standing, March 1967	99
XVII. Extreme Spread, Three-Round Burst, Low Rate of Fire, Standing, March 1967, Individual Burst	100
XVIII. Extreme Spread, Three-Round Burst, High Rate of Fire, Standing, March 1967, Individual Burst	101
XIX. Co-ordinates, Three-Round Burst, Low Rate of Fire, Standing, March 1967	102
XX. Co-ordinates, Three-Round Burst, High Rate of Fire, Standing, March 1967	104
XXI. Verification Test, Impacts Within the Zone of Consideration	106
XXII. Verification Test, Multiple Hits Versus Range	107
XXIII. Trigger-Pull Rate by Individual and Test Condition (Trigger Pulls Per Second)	108

LIST OF TABLES (Continued)

	Page
XXIV. Pseudo-Tactical Test Data, Controlled Burst, Standing . .	109
XXV. Pseudo-Tactical Test Data, Trigger-Manipulated Burst, Standing	111
XXVI. Pseudo-Tactical Test Data, Full Automatic Extended Burst, Standing	113

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LIST OF SYMBOLS

- i denotes the round number within a burst
- j denotes the burst number (a three-digit number)
- m denotes the firer number
- ES denotes extreme spread
- H horizontal coordinate of an impact point
- N_j denotes the number of rounds in the jth burst
- S standard deviation of an individual measurement
- V vertical coordinate of an impact point
- v_{ij} vertical coordinate for the ith round of the jth burst
- σ averaged values of standard deviations, S

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GLOSSARY

SAWS - Small Arms Weapons Systems

SPIW - Special Purpose Individual Weapon

CB - Controlled Burst

TM - Trigger manipulated burst of full automatic fire

FA - extended burst of full automatic fire

S - Standing

CAL - Calibration

SW - Sweep

PT - Point

spm - shots per minute

successful trigger pull - at least one hit per trigger pull

beaten zone - the area where a burst of automatic fire strikes the ground

seconds of engagement - time recorded from the first to last shot of each trial

rate-of-fire - natural cyclic rate-of-fire of a particular weapon mechanism (shots per minute)

Tactical rate-of-fire - average number of rounds expended per minute during an engagement of a target array (rounds per minute)

Sustained rate-of-fire - rate at which weapon can fire indefinitely without seriously overheating

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I. INTRODUCTION

The Special Purpose Individual Weapon (SPIW) Research and Development program is developing a rifle that can be fired in three different modes of automatic fire: controlled burst, trigger-manipulated burst and the extended full-automatic burst. The controlled burst consists of three rounds fired at an approximate rate of 2000 shots per minute; the number of rounds fired per burst is limited by the mechanism. For the purpose of this report, the trigger-manipulated burst, by definition, contains two to five rounds; whereas, the extended full-automatic burst is more than five rounds. Both the trigger-manipulated and extended full-automatic bursts are fired at an approximate rate of 450 shots per minute and the rifleman can limit the number of rounds fired per burst.

Early in 1966, the Ballistic Research Laboratories (BRL) conducted a pilot study of the motion of man and weapon during automatic fire from the shoulder.* The purpose of that investigation was to determine the rate-of-fire at which weapons of a low level of recoil impulse could be held on target during an extended burst in full-automatic fire of at least 10 rounds per trigger pull. The dispersion patterns obtained in extended, low rate-of-fire bursts were compared to patterns obtained by rapidly triggering, controlled bursts of three rounds per trigger pull at a high rate-of-fire. It was shown that the vertical dispersions of the two modes of fire were comparable. Thus, if the controlled-burst mode proved to be comparable in overall effectiveness and could fulfill the tasks normally assigned to the full-automatic mode, then the full automatic requirement could be eliminated. This would reduce the mechanical complexity of the trigger assembly and thereby increase the reliability of the mechanism.

*It is planned to publish the results of this study in a separate report.

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Results of the BRL study and a paper by Mr. Charles Rhoades of the Project Manager, Rifles Office, were presented at the SPIW Executive Committee meeting held on 13 October 1966.* Mr. Rhoades listed various combinations of modes which could be incorporated in the SPIW point fire rifle. While discussing relative merits of the possible combinations, Mr. Rhoades emphasized that although the inclusion of controlled-burst, full-automatic and semi-automatic modes of fire seemed to be the most effective, there was some doubt that elimination of the full-automatic mode would result in a loss in overall effectiveness.

In view of the results indicated by the pilot study, BRL was asked by the Project Manager, Rifles to design and conduct a test which would compare the relative hit capability of the controlled-burst versus full-automatic modes of fire. The task was accepted and on 26 October 1966, a sub-committee consisting of representatives from the U.S. Army Infantry Board (USAIB), TECOM Headquarters, Frankford Arsenal, Combat Developments Command Infantry Agency (CDCIA), and BRL met to discuss the test plan. The test was carried out by BRL with the assistance of the USAIB at Fort Benning, Georgia during the period 14 to 23 November 1966.

One of the authors, who is an experienced Infantry Officer, reviewed military tasks normally assigned to the full-automatic mode for Automatic Rifles. His survey was to confirm the adequacy of the basic test plan (Section III, following) for the comparison of the modes of fire and to provide the basis for analysis of the test results. Field test facilities are described in Appendix A.

Included in the present report are:

- A presentation of the results of the "Comparison of Modes of Fire Test"
- A review of the tasks presently assigned to full-automatic fire

*Minutes of the Combined SPIW Executive Committee and Industry Meeting 12-13 October 1966. Fort Benning, Georgia.

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- An analysis of the data in terms of present doctrine
- A comparison of target area coverage
- Data and computations which can assist in establishing military characteristics for rifles capable of firing a controlled burst.

(UNCLASSIFIED) II. SUMMARY OF PRESENT DOCTRINE

We initially determined what "application of fire" doctrine could be used in the analysis. Because the SPIW is a developmental item, current doctrine has not been revised to reflect any specific or general characteristics of the weapon. Doctrine pertaining to the Browning Automatic Rifle, M14A2 Automatic Rifle, and M16A1 Rifle was examined to see if it could be applied to the SPIW.

A. Assumptions

The following assumptions were made to define the limits of the discussion:

- The dispersion characteristics of the present SPIW hardware will not change.
- This weapon will be employed in the Automatic Rifle role.
- There will be a companion automatic weapon for long-range automatic fire.
- The sustained rate-of-fire, when established, will provide a volume of fire comparable to that available from the standard Automatic Rifle.

B. Source of Information

Doctrine of fire data were obtained from Department of the Army Field Manuals (DA FM). The primary sources of doctrine were DA FM's 23-12 and 23-16 pertaining to the employment and marksmanship of the Automatic Rifle. Other sources were the DA FM's pertaining to the combat in fortified and built-up areas, patrolling, and desert, northern, and mountain operations. These sources were checked for possible doctrine which might amplify or restrict the doctrine contained in the two primary sources. No amplification or restriction was found.

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C. Combat Conditions

1. Targets. The following is a list of conditions under which combat targets occur on the battlefield.

- The enemy is seldom visible except during his assault.
- Most targets are linear in nature and consist of men and objects irregularly spaced along covered and concealed areas.
- Most targets can be detected by smoke, flash, dust, noise, or movement and will be visible momentarily.
- The range to individual personnel targets rarely will exceed 300 meters.

2. Engagement Conditions. The fire of a rifle squad in combat is directed under the following conditions:

- Squad members are under stress caused by fear, fatigue, hardship, and battlefield noise.
- Squad members do not limit their fire to clearly defined enemy, but also fire into clumps of brush, dark shadows, and other likely enemy locations.

D. Present Doctrine

The doctrine states that automatic fire is employed to obtain fire superiority and to engage enemy formations, large point targets, and automatic weapons out to a range of 460 meters. Emphasis is placed on volume and accuracy of fire. To insure minimum dispersion, Automatic Riflemen are taught to fire bursts of two or three rounds by means of trigger manipulation (TM). Present doctrine does not include extended bursts of full automatic (FA) fire.

For the application of fire, enemy personnel targets are categorized as linear, column, point and area targets. The column is a special case of the linear target and is listed separately because its vertical nature requires a particular method of engagement. The applications of automatic fire to these targets are presented on the following page.

1. Target

- Linear. The Automatic Riflemen fire bursts of two or three rounds, distributing their fire from the center to just outside the known flanks and back to the center.
- Column. The Automatic Riflemen fire in three-to-five round bursts at the center of the target but do not distribute their fire. The beaten zone of the Automatic Rifles is intended to adequately cover the target.
- Point. The Automatic Riflemen fire in three-to-five round bursts at targets such as crew-served weapons or small groups of personnel. Automatic fire is used in order to take advantage of the larger beaten zone.
- Area. The Automatic Riflemen fire in three-to-five round bursts and distribute their fire in width and depth within their assigned sectors.

2. Type of Fire

Doctrine also states the employment of Automatic Rifle fire for the following situations.

- Day Assault. The Automatic Riflemen fire in short bursts of two or three rounds from the underarm position at known or suspected enemy locations giving priority to enemy automatic weapons.
- Night Assault. The Automatic Riflemen fire a short burst of two or three rounds from the underarm position every time the left foot strikes the ground.
- Limited Visibility. The Automatic Riflemen fire in bursts of three-to-five rounds within their assigned sector. A heavy volume of fire is directed toward the muzzle-flash of enemy automatic weapons.

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III. TEST PLAN

The test plan developed was titled "The Comparison of Modes of Fire Test." It was comprised of two major subtests: a Verification Test and a Pseudo-Tactical Test. A summary of the test plan is presented here with a detailed description given in Appendix B.

A. Summary Test Plan

1. Subtest I: Verification Test.

a. Purpose

This test was to determine if the vertical dispersion of rapidly triggered, controlled bursts is comparable to that of extended bursts of low-rate, full-automatic fire.

b. Target

A horizontal line was displayed on a 4 x 8-foot panel to represent linear targets and crosses for point targets. These basic targets were considered to be the type of targets most often engaged with automatic fire from a rifle at the shoulder. The distance from the firers to the panel was 500 inches.

2. Subtest II. Pseudo-Tactical Test.

a. Purpose

This test was to determine which mode of fire enabled the average subject to engage and hit the greatest number of point targets when a time stress factor is introduced. The successive engagement of a series of point targets was the procedure used.

b. Target

Ten, M-type, * pop-up, silhouette targets were positioned 10 meters apart at a 100-meter range. The nominal exposure time was 6 seconds.

c. General

In this subtest the trigger-manipulated, two-to-four round burst was added to provide data conforming to present doctrine.

* A silhouette of a standing man.

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B. Limitations

In addition to the requirements arising from doctrine and the desirability for conducting this test in the shortest possible time, with the least expenditure of funds, the following limitations applied to our investigations.

1. Because of the lack of tracers, any choice between modes of fire which depends on tracer mix or upon the presence of tracers, could not be addressed.

2. Because of the limited signature per round, any method of fire utilizing such information could not be addressed.

3. Because of the inability to realistically recreate tactical situations, the pseudo-tactical tests were therefore designed to force the subject to engage in motions which would be required during tactical situations.

4. Because ammunition was in short supply, each test routine had to be designed so that a malfunction or human error would not negate the entire sub-routine.

C. Selection of Riflemen

The 11 riflemen used for the test were selected from the group used during the SPIW Engineering Design Test (EDT) conducted by the U.S. Army Infantry Board. Each subject had fired over 2000 rounds from the SPIW and was considered to be thoroughly trained with the weapon.

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IV. TEST RESULTS

A summary and limited discussion of the test results is presented. It is anticipated that these data and computations will be included in a larger study to assist in establishing the military characteristics for rifles capable of firing a controlled burst. A detailed tabulation of the raw data and various quantities calculated is contained in Appendix C.

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The data generated during the test while firing from the prone or supported position are not included. An analysis of these data indicates that the combination of weapon support, rate of fire, muzzle compensation, and the light-weight flexible barrel adversely affected the dispersions obtained with the controlled-burst mode of fire. These results definitely emphasize the requirement for a more rigid barrel. The dispersion patterns obtained with the rifle when firing from the standing position are reasonably characteristic of what can be expected. The AAIC weapon used in this test was tuned for a right-handed rifleman to be fired from the standing position. It is hoped to present a detailed dynamic analysis of the rifle in a later report on the SPIW prototypes of 1966.

A. Verification Test Results

1. Overplots. For each test condition a summary plot was prepared of all impact points on the panel so that visual comparisons could be made of target coverage and the magnitude of dispersion obtained with each mode of fire. The average vertical miss distance (\bar{V}) and standard deviation* (σ_v) are shown with each overplot.

The results for a single firer (Firer No. 1) in the controlled-burst and extended burst modes, against a point target, are presented in Figures 1 and 2. Similar results against a sweep-type target are presented in Figures 3 and 4. Five trials of 12 rounds each are represented in the overplots presented in Figures 1 through 4.

*Of an individual measurement.

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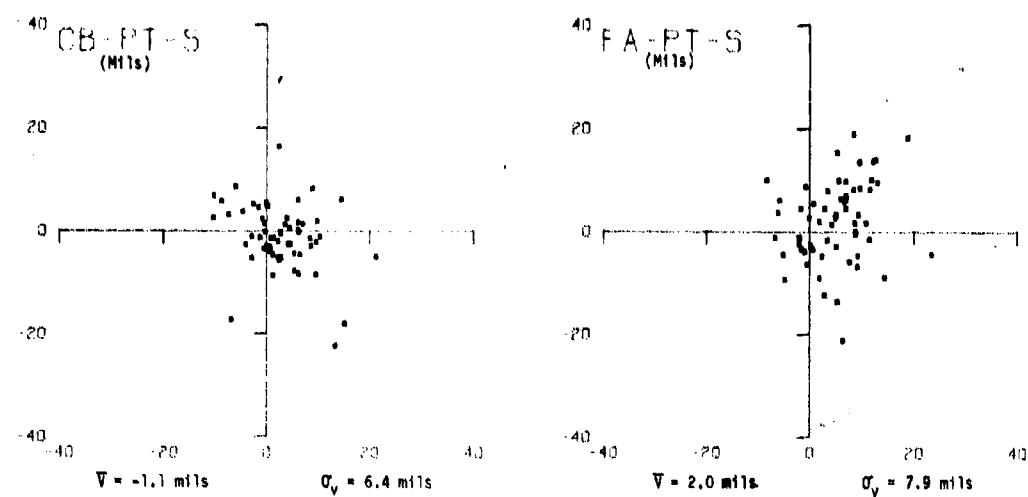


Figure 1. Controlled-burst,
point target, standing, Firer No. 1

Figure 2. Full-automatic,
point target, standing, Firer No. 1

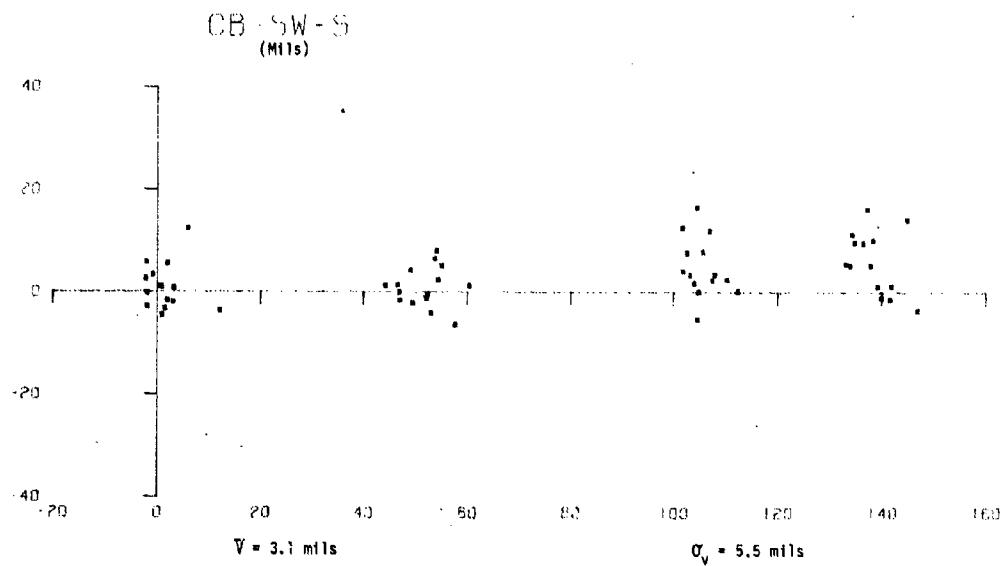


Figure 3. Controlled-burst, sweep target, standing, Firer No. 1

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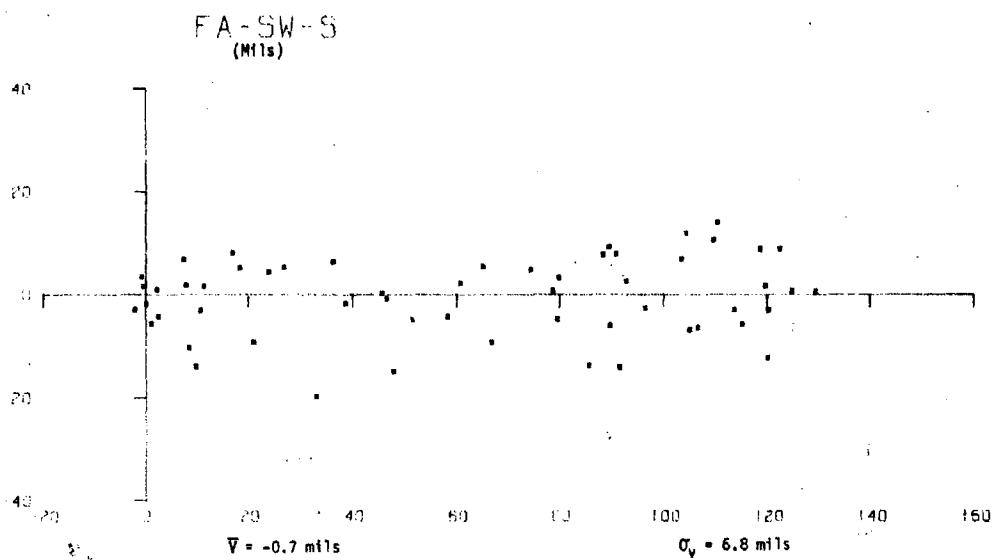


Figure 4 (U). Full-automatic, sweep target, standing, Firer No. 1

When each rifleman engaged a sweep-type target he was provided a magazine containing 12 rounds and instructed to commence firing on signal, using as his initial aim point the cross at the left end of the line. When firing the controlled-burst mode he was to pull the trigger a total of four times while attempting to fire at a rate of two to three trigger pulls per second.

The plots do not distinguish the impact points of one trial from those of another; therefore, each of the four clusters pictured in Figure 3 consists of three impact points from each of the five trials. This target pattern represents the extreme case where the firer was consistent in sweep rate and trigger pull rate from one trial to the next; the controlled bursts struck the target in nearly the same location each time. Inspection of the target photographs presented in Appendix D reveals that, on the average, the riflemen were not as consistent from trial to trial as was Firer No. 1. When considering a single firer, coverage of the target region is different for the controlled-burst (CB)

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sweep condition as compared to the full-automatic (FA) sweep condition. For CB sweeping, the impact points are generally clustered with voids between the clusters. For FA sweeps the impact points are more uniformly spread out in the horizontal direction. The voids between clusters are more pronounced at short ranges. If the target panel used in this test were fired upon in the same manner but at a range of approximately 50 yards, the horizontal distance between individual CB clusters would be reduced to approximately the distance between rounds within a cluster. At this range, the distribution of projectiles along the horizontal is comparable to the target area coverage provided by the extended burst of full automatic fire. The range at which target coverage is comparable will vary inversely as the average extreme spread (\overline{ES}) of the controlled burst. Doubling the average extreme spread (\overline{ES}) of the controlled burst reduces to 25 yards the distances needed to obtain comparable target coverage.

Two or more riflemen engaging the same sweep-type target with the controlled-burst will more closely approach the target coverage provided by the full-automatic mode. Visual inspection of the target photographs (Appendix D) indicates that riflemen are not consistent from trial to trial (sweep to sweep) and do not place each burst in the same region of the panel. In addition, several riflemen tend to supplement each other.

To illustrate, presented in Figures 5 and 6 are overplots of a single trial of 12 rounds for five riflemen engaging a sweep-type target with the controlled-burst and full-automatic modes.

The plots presented in Figures 7 through 11 provide a comparison of target region coverage and include all five trials of the 11 firers for the test condition listed. For a detailed description of a particular test condition refer to Appendix B. Note that the markings on the overplots are abbreviations of the captions.

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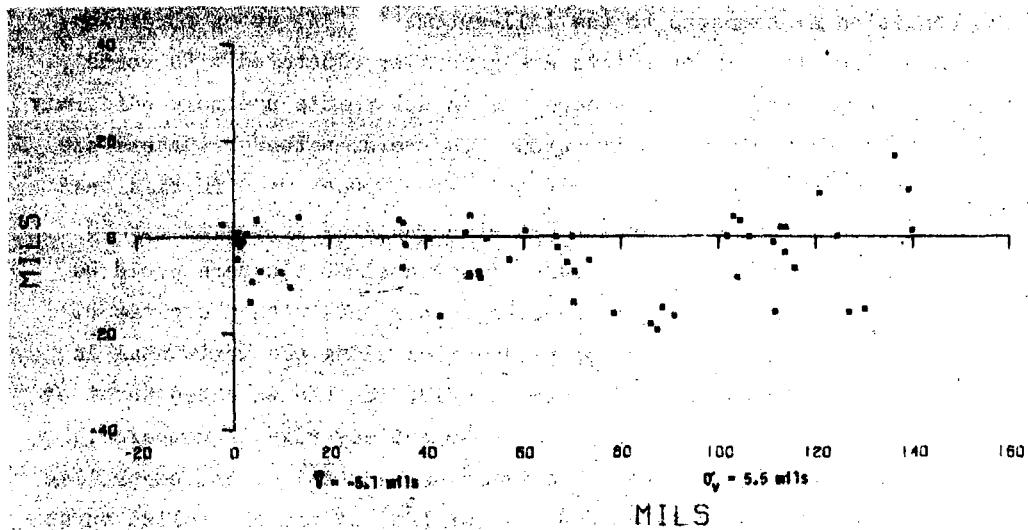


Figure 5. Controlled-burst, sweep target, standing, one trial of Firers 1 through 5

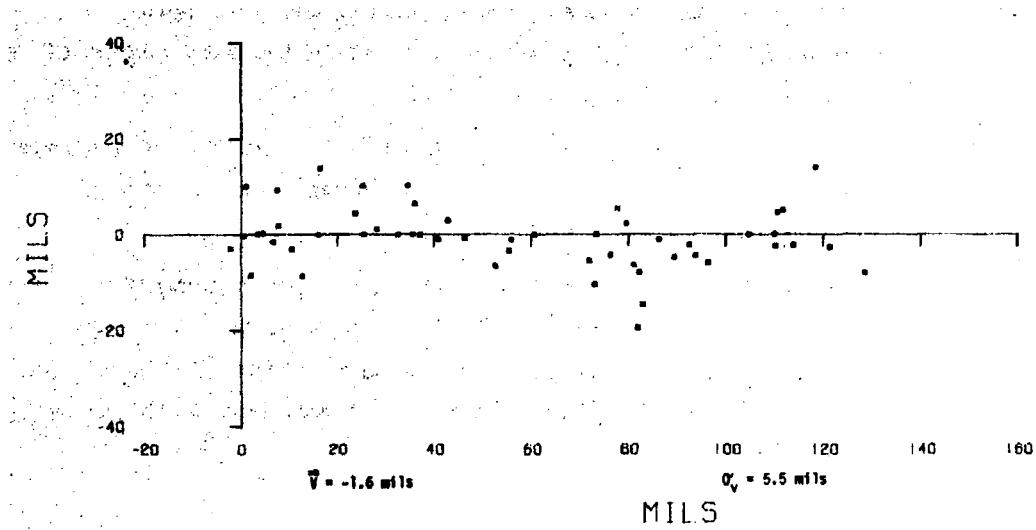


Figure 6. Full-automatic, sweep target, standing, one trial of Firers 1 through 5

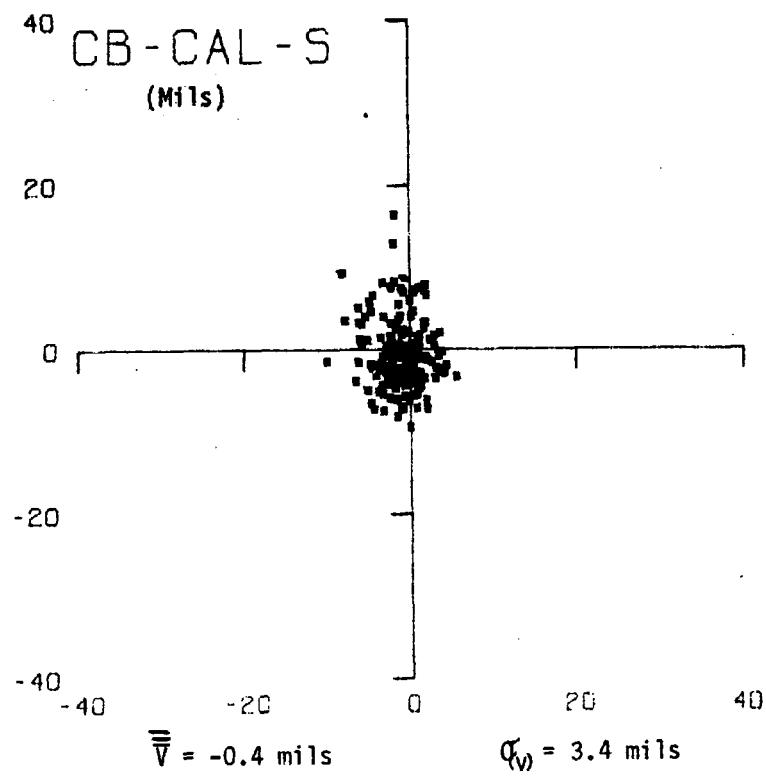


Figure 7. Controlled-burst, calibration target, standing

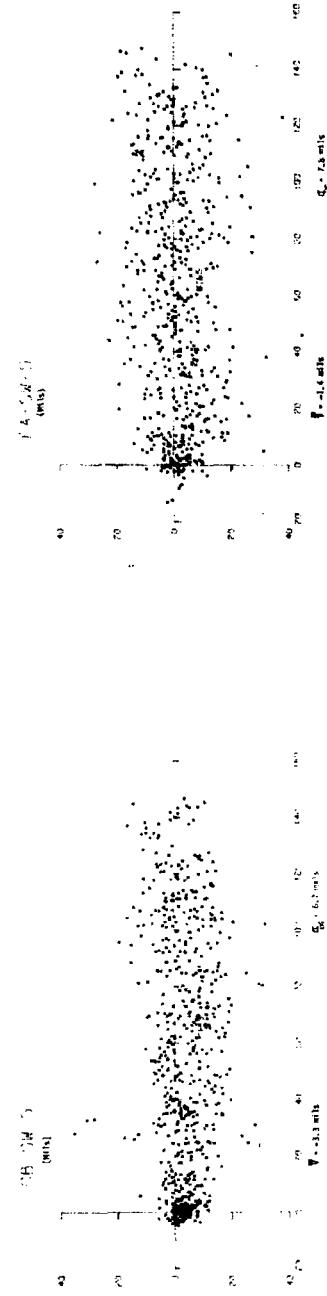


Figure 8. Controlled burst, sweep target, standing

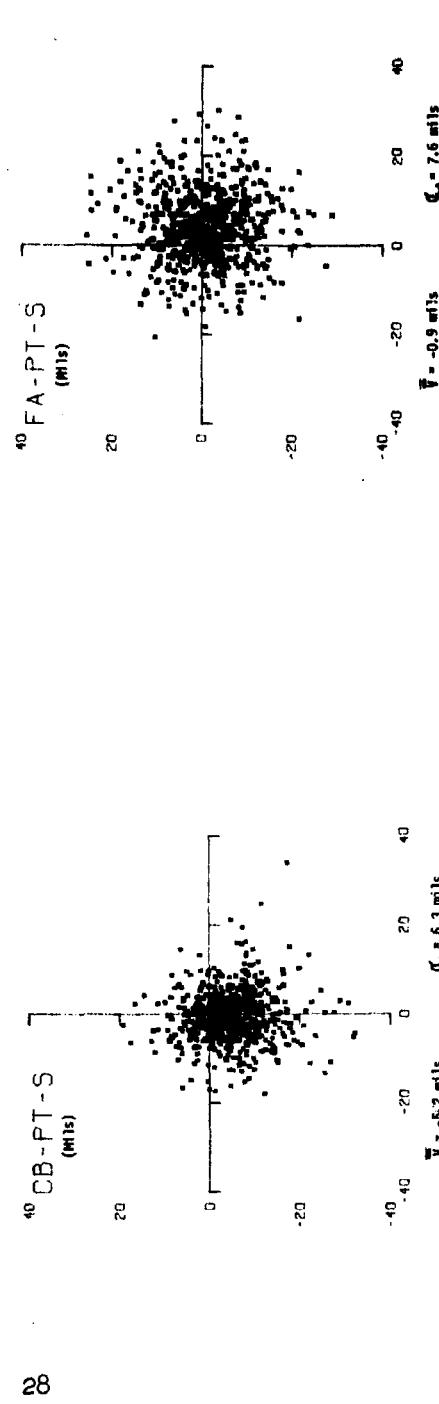


Figure 9. Full automatic, sweep target, standing

Figure 10. Controlled burst, point target, standing



Figure 11. Full automatic, point target, standing

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2. Controllability. Targets are not always visible and often it is necessary to direct rifle fire at an area where the enemy is known or suspected to be located. Large area targets are engaged by shifting accurate fire from one aim point to another or linearly across the target to cover the area systematically. For the purpose of this study, weapon controllability is defined as the ability of a rifleman to direct his rifle fire so that it strikes the target as close to the point (or line) of aim as possible.

The panel was selected as a desirable target because the number of impacts recorded is maximized. The size, attitude, and range to a panel, taken with respect to the firer, are immaterial so long as the tactical target can be projected onto the panel.

The wooded area presented in Figure 12 projects onto the target panel as a band approximately 10 inches high and extending the width of the panel. The range to the panel was selected so that 1 inch on the panel would represent an angular measurement of 2 mils.

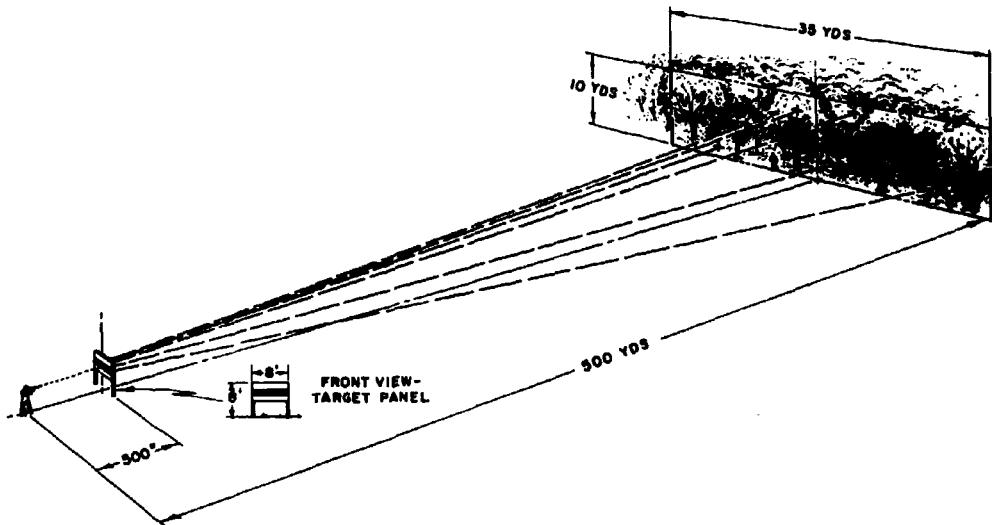


Figure 12 (U). Target area projected onto a target panel

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The wooded area would be represented on an overplot by a band which is 10 mils above and below the centerline and approximately the width of the plot. Therefore, one method which measures relative controllability between modes of fire is to count impacts which strike within a designated band or zone of consideration across the center of a sweep-type target or about the center of a point-type target. Various sized bands drawn on the overplots of Figures 8 through 11 could be used to measure the relative target area coverage with the two modes of fire.

The zone of consideration represented in Figure 13 has been subdivided into segments of equal width. Each segment has a height "a" and a width "b."

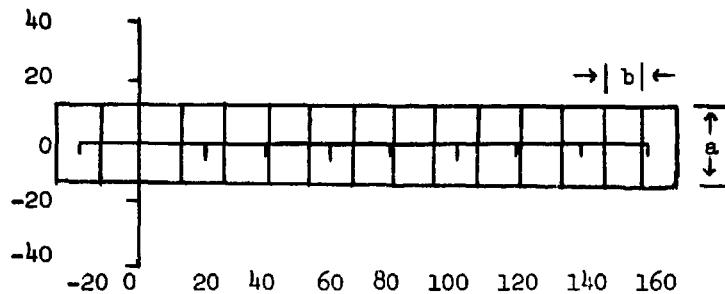


Figure 13 (U). Zone of consideration, sweep target computer simulation

Dimensions "a" and "b" were allowed to vary so as to represent a $5 \times 1 \frac{1}{2}$ -foot man at ranges of 50 to 500 yards. The impact points for each trial (a total of 55 per test condition) of all 11 men were plotted and hits within the zone recorded. The number of segments hit and the number of hits within each segment were recorded for each range considered. Table XXI in Appendix C gives these data.

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The curve presented in Figure 14 represents the ratio of the total number of segments hit with the full-automatic mode relative to the total number with the controlled-burst mode of fire. For each trial when firing in the full-automatic mode a continuous burst of 12 rounds was fired at the rate of approximately 450 shots per minute. When firing in the controlled-burst mode, four rapidly triggered bursts of three rounds each were fired. The rate-of-fire for the controlled burst is approximately 2000 shots per minute and the average extreme spread (ES) was 6.3 mils.

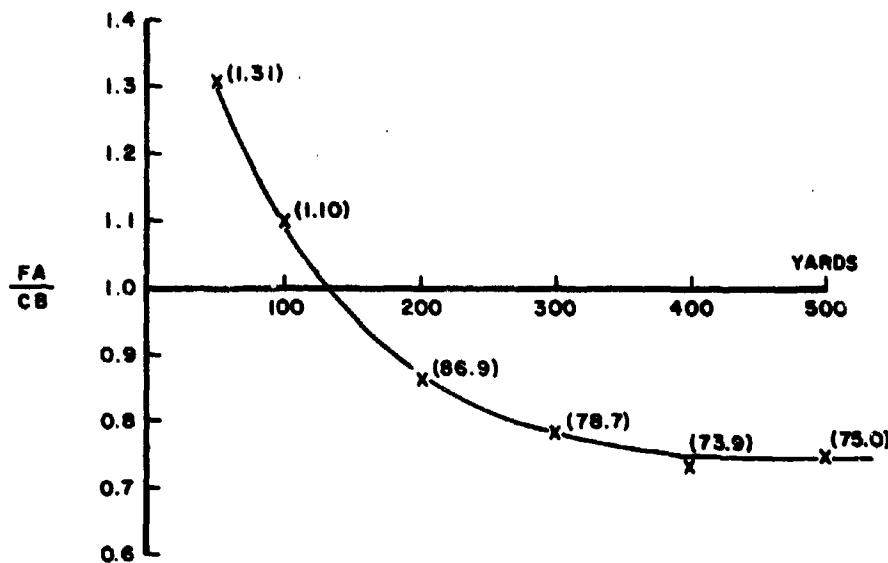


Figure 14 (U). Ratio of hit probability, FA to CB versus range

The curve indicates that it is more advantageous to engage a linear target at short range with extended burst, full-automatic fire. The full-automatic mode of fire more uniformly distributes the projectiles along a linear target and therefore increases the probability of a hit. At longer ranges the advantage shifts to the controlled-burst mode because the rifleman has more control over the placement of the burst and the projectiles are not in as tight a cluster. The range to crossover where

**However, the advantage at longer ranges must be tempered somewhat by the reduced likelihood of engaging targets at the longer ranges.*

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the advantage shifts from one mode of fire to the other is a function of the average extreme spread of the controlled burst, the average trigger-pull rate of the rifleman and his rate of angular sweep when firing in the controlled-burst mode.

The average trigger-pull rate during this test was 2.1 trigger pulls per second, or an ammunition expenditure (tactical rate of fire) of approximately 380 rounds per minute. An increase in rate to 2.5 trigger pulls per second would be necessary to equalize the rate of ammunition expenditure for the two modes of fire. As the trigger-pull rate is increased, the ability of the rifleman to direct the fire of the controlled burst would be expected to decrease and the curve in Figure 14 would shift slightly upward.

The purpose of using the "number of segments hit" method for measuring controllability was that if the segment was stipulated to be the approximate size of a standing man, then counting the number of segments hit would provide a rough means of comparison. It was noted during the analysis that a large percentage of the segments received multiple hits, especially with the controlled-burst mode. Table I presents a summary of the percentage of segments receiving multiple hits for each mode and range.

Table I (U). Percentage of Multiple Hits Versus Range

Mode	Range (yards)					
	50	100	200	300	400	500
FA	14.1	4.2	1.9	-	-	-
CB	60.9	42.4	18.3	8.5	8.4	5.5

At 200 yards, a larger percentage of the segments received multiple hits. This is understandable because at 200 yards a man 5 feet tall subtends an angle of approximately 8 1/2 mils and the average extreme spread for the controlled burst was 6.3 mils. We would expect the probability of a multiple hit to drop off rather rapidly as the range approached 200 yards.

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The large percentage of multiple hits with the controlled-burst mode indicates that there were more impacts within the zone of consideration with this mode of fire. The curve plotted in Figure 15 represents a ratio of the total number of rounds fired which impacted within the zone of consideration.

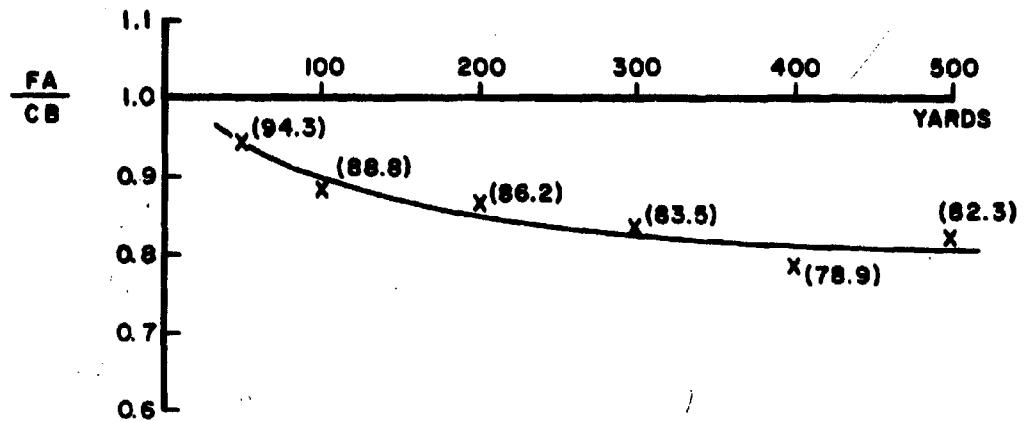


Figure 15 (U). Ratio of projectile impacts within the target area versus range, full-automatic to controlled-burst modes

This plot indicates that beyond approximately 200 yards, 15 to 20 percent more hits within a given target area can be expected with the controlled-burst mode of fire. At shorter ranges the uniformity of target area coverage must be considered.

For those readers who prefer to perform statistical comparisons, there are presented in Tables IX through XIV of Appendix C various numerical measures of dispersion. We are unable to establish a single measure which includes all the elements of dispersion; hence, we have presented those which appear to be of interest. Figures 3 and 4 are examples of target patterns which are difficult to compare. Due to the additional components of dispersion that are introduced when a rapidly triggered controlled burst is employed against a sweep type target, a single best numerical measure for comparing patterns is difficult to select.

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B. Pseudo-Tactical Test Results

This test provides a means of comparing the controlled burst to a two-to-five round trigger-manipulated (TM) burst of low rate full automatic fire when engaging a linear array of visible point targets. A test condition employing a full automatic extended burst (30 rounds per burst) was tested; however, the results showed that this mode of fire is not appropriate for this array of targets.

Table II presents a summary of the test results. A detailed description of the test as it was conducted is presented in Appendix B with the raw data presented in Appendix C.

Table II (U). Pseudo-Tactical Summary Sheet

Line	Description	CB S*	TM S*	FA S*
1.	Trigger pulls/Second (Rate of Target Engagement)	1.3	1.2	NA**
2.	Rounds/Trigger Pull	3.0	3.3	30
3.	Tactical Rate of Fire (Shots per Minute)	230	236	450
4.	Targets Hit/Target Engaged (Successful Trigger Pull)	0.59	0.44	0.15***

*S - Standing Position

**NA - Does not apply to this mode of fire.

*** Assumes all exposed targets were engaged during each trial.

As each target was engaged only once with a single trigger pull, Line 1 also indicates the relative time required to engage individual targets. The trigger-manipulated (TM) mode averaged approximately the same number of rounds fired per burst as the controlled-burst mode; however, the controlled burst obtained approximately 30 percent more successful trigger pulls. The difference in hit capability is attributed

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to the difference in average extreme spread for the two modes of fire. The average extreme spread (\overline{ES}) for three rounds fired at the full automatic rate was approximately 14.5 mils (Table XVI of Appendix C); whereas, the \overline{ES} for the three round controlled burst was 6.3 mils. The rate of fire for the full-automatic mode was 450 shots per minute and the controlled burst was fired at approximately 2000 shots per minute.

The percentage of multiple hits obtained with the trigger-manipulated mode was 18 percent, compared to 42 percent with the controlled-burst mode of fire. It is interesting to note that the Verification Test data predicts a 42 percent multiple hit capability (Table I, page 32) with this mode at approximately the same range.

(UNCLASSIFIED) **V. TEST RESULTS AND PRESENT DOCTRINE**

A. Discussion

1. Applicability of Doctrine. The Browning Automatic Rifle, M14A2 Automatic Rifle, M16A1 Rifle, and the SPIW are similar in that they are individual shoulder weapons capable of automatic fire. On this basis current doctrine can be applied to the application of automatic fire from the SPIW when in the Automatic Rifle role.

2. Accuracy of Fire. A measure of accuracy is the percentage of successful trigger pulls (at least one hit per trigger pull), see line 4 of Table II, Section IV. The test results indicate that the controlled-burst mode provides greater accuracy than the trigger-manipulated, full-automatic burst. This is because the higher rate-of-fire of the controlled burst yields smaller extreme spreads per trigger pull than the two-to-four round trigger-manipulated burst of low rate, full automatic fire.

The application of automatic fire to the targets and situations previously defined requires the use of one or more aiming points. The determining factor in the choice of an aiming point is full coverage of the target. In situations involving column targets, area targets, limited visibility conditions, and assault fire, it appears that the dispersion of the burst provides a considerable portion of the effect. It

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might seem that the smaller dispersion pattern of the controlled burst would not be advantageous under these conditions. If the dispersion of the controlled burst cannot cover the target when one aiming point is being used, then the fire could be distributed by using multiple aiming points. This should hold true in the other cases where burst dispersion is a major factor in the coverage of the target.

3. Volume of Fire. A present SPIW prototype provides a rate of fire of approximately 2000 shots per minute for the controlled-burst mode and approximately 450 shots per minute for the full-automatic mode of fire. The maximum sustained rate (60 shots for 1 minute) of the M14A2 Automatic Rifle was used as a basis for comparison because there is no sustained rate of fire information available for the SPIW. Based on this figure and the rate of fire for the controlled-burst mode, a firer would have to squeeze the trigger once every 3 seconds to provide a volume of fire comparable to 60 shots in 1 minute.

B. Findings

1. Current doctrine can be applied to the SPIW as a basis for comparing the two modes of fire.

2. The doctrinal requirement for accuracy of automatic fire is met by the controlled-burst mode.

3. The doctrinal requirement of volume of fire is met by the controlled-burst mode.

4. Current doctrine does not consider engaging targets with extended bursts of full automatic-fire.

C. Summary

The SPIW prototype with the capability of either trigger-manipulated full-automatic fire at a low cyclic rate or controlled-burst fire at a high cyclic rate of fire will fulfill current doctrine for Automatic Rifle fire. A change in doctrine is implied with the possibility of effectively engaging targets with extended bursts of full-automatic fire.

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VI. CONCLUSIONS

We will assume that the basic SPIW rifle will continue to be developed as it presently exists. The rifle will fire cartridges serially, each containing a single flechette, with approximately 0.54 pound-seconds of recoil impulse. It will have the capability of firing a three-round, mechanically controlled burst at a rate of fire of approximately 2000 shots per minute and an extended burst of full-automatic fire at approximately 450 shots per minute.

Previous studies have established the advantage in hit capability of engaging point targets with small, tightly grouped clusters of projectiles. These clusters can be obtained by either sequentially launching individual projectiles, such as the controlled burst of the SPIW rifle, or by simultaneous launch as accomplished with shot gun cartridges.

The results of the present report indicate an approximate 30 percent increase in hit capability, against a series of point targets, with the three-round controlled burst compared to a two to five round trigger-manipulated burst of low-rate, full automatic fire.

The test results also imply the desirability of changing doctrine for engaging targets with full-automatic fire. With a rifle of the SPIW low level of impulse, low rate, full-automatic fire can be fired effectively from the shoulder of a standing rifleman. A limited study of those data generated during this test indicates that there is a decided advantage gained by engaging large area targets, containing enemy which are hidden from the firer's view, with extended bursts (hose technique) of full-automatic fire. The full-automatic fire more uniformly distributes the projectiles over the target area than does a series of rapidly triggered controlled bursts or short trigger-manipulated bursts of full-automatic fire. The advantage in increased hit probability with the more uniform distribution of projectiles increases as the range to the target area decreases.

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We could conclude that if there is a tactical requirement for both controlled-burst and extended burst full-automatic fire, then the rifle should be capable of firing in both modes. However, the mechanical stresses which are placed on a rifle mechanism by having a very high rate of fire and the complexity added by including mechanism to radically reduce the rate of fire may produce unacceptable levels of malfunction.

There is another choice which could alleviate the problem of weapon reliability as a major factor and should therefore be thoroughly investigated. This second choice is to provide the capability to fire both the extended burst of full automatic fire and the short burst by trigger manipulation at a single cyclic rate of fire. Present Automatic Rifles (M16A1, M14A2) have this capability; however, the low level of recoil impulse of the present SPIW prototype allows for greater weapon control.

The SPIW development program has not examined this latter alternative. Further, a short trigger manipulated burst of low-rate full-automatic fire is approximately 30 percent less in hit capability against point targets than a controlled burst. If the requirement for the short burst of automatic fire only occurs about 10 percent of the time in combat then the military necessity for the controlled-burst mode is not as important as it originally appeared. The test results also indicate weapon controllability, as it pertains to projectile dispersion at the target area, is comparable when firing either extended bursts of low-rate full-automatic fire or rapidly triggered-controlled bursts. The amount of ammunition expended during any given period of time also is about equal.

Other factors to be considered are the initial cost of the more complex rifle, cost of repair parts, and maintenance costs. These "trade-offs" should be considered in a "total systems analysis."

The multiple-flechette round also should be considered in this analysis; however, this approach may not necessarily be the solution to the problem! Additional flechettes per cartridge, launched at approximately the same muzzle velocity, dictate a higher impulse imparted to the

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rifle per cartridge fired. An increase in impulse level reduces the rifleman's control of the weapon when firing in the full-automatic mode. The advantage gained with the multiple-flechette round may be lost when attempting to fire the Automatic Rifle from the shoulder in the full-automatic mode.

Before a systems approach to this analysis can be initiated, there are at least two major questions which must be answered. First, what type of targets are most often engaged in combat? The frequency and description of the targets to be engaged must be known before meaningful weighting factors can be established. Second, what is the malfunction rate with the present SPIW rifle if the requirement for two different rates of fire is upheld?

ACKNOWLEDGMENTS

We gratefully acknowledge the assistance of Mr. Stanley Lentz and Miss Helen Coon. In addition, we extend our thanks to the many others who have contributed to this report.

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APPENDIX A

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FACILITIES

1. General

The comparison of Modes of Fire Test was conducted at Fort Benning, Georgia, on "Fiske Range" from 14 through 23 November 1966.

2. Ranges

a. Verification Test Range



Figure 1A (U). Verification test range

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(1) Targets



Figure 2A (U). Sample target

The target material was a 4 x 8-foot sheet of white paper, stapled to a sheet of 1/4-inch plywood. The plywood panels were attached to the target frame in a manner to facilitate rapid replacement and were positioned at a height which would allow the weapon to be at zero degrees elevation during firing.

(2) Firing Position

The firing positions were located 500 inches from the panels. At this distance the panels were close enough to contain all impact points; at ranges less than 500 inches, pieces of sabot would have impregnated the paper targets.

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b. Pseudo-Tactical Test Range



Figure 3A (U). Pseudo-tactical range
(1) Targets



Figure 4A (U). Silhouette target array

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Standard M-type, pop-up, silhouette targets were used. These targets are 6 feet in height and represent a standing or running man.

(2) Firing Position



Figure 5A (U). Pseudo-tactical firing position

The test subjects fired while standing in a foxhole, located at the vertex of the sector subtended by the targets.

3. Weapons

The weapons used were prototypes of the SPIW produced by the AAI Corporation. Five of the weapons used during the test were those originally delivered to the U.S. Army Infantry Board for the Engineering Design Test. Two additional weapons were provided by the Development and Proof Services (D&PS), Aberdeen Proving Ground, Maryland, for use as stand-by weapons.

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Durability and reliability measurement was not one of the objectives of this test; therefore, detailed records of stoppages and malfunctions were not maintained.



Figure 6A (U). AAIC Weapon

Throughout the test, the 40mm grenade launcher was attached to the point-fire rifle, and the three-round magazine was loaded with dummy ammunition and installed in the launcher. The purpose of this loading was to provide maximum barrel support and weapon weight. Bayonets, bipods, and slings were not used.

4. Ammunition

Approximately 23,000 rounds of the FAT 209 ammunition were fired. Listed in Table III are the quantities and characteristics of each lot fired.

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Table III (C). Ammunition Data (U)

<u>Lot No.</u>	<u>Quantity</u>	<u>Dispersion[*]</u> <u>x</u> <u>y</u>	<u>Muzzle^{**}</u> <u>Velocity</u>
5	17,000	0.90 0.91	4,831
8	1,360	0.96 0.71	4,849
9	4,040	0.77 0.92	4,809

* Standard deviation of an individual measurement in mils

** Feet per second

5. Weather

The weather conditions throughout the conduct of the test were as follows: The temperature was between 65° and 75° with a clear, bright sky, and there was usually a light breeze in the morning hours with still air in the afternoon.

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APPENDIX B

PROCEDURES

1. Detailed Test Plan

a. Verification Test

(1) General

- (a) Range: 500 inches
- (b) Number of Subjects: 11
- (c) Rounds/Subject: 510

(2) Target Patterns

Displayed on a 4 x 8-foot panel were sweep and point-type target patterns. An additional array of point targets was used for the purpose of calibrating the man-weapon combination. A picture and description of each pattern as it appeared on the panel is as follows:

(a) Calibration



Figure 1B. Calibration target

(b) Sweep

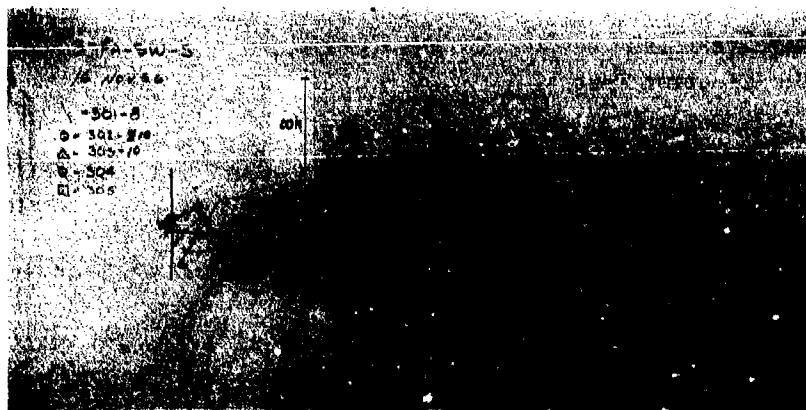


Figure 2B. Sweep target

The target is a thin horizontal line marked through the center of the panel. Approximately 1 foot in from the left edge of the panel was a vertical mark through the horizontal line.

(c) Point



Figure 3B. Point target

The target consists of three crosses spaced evenly across the vertical center of the panel.

(3) Detailed Plan

Verification Test

<u>Firing Position</u>	<u>Mode of Fire</u>	<u>Type of Target</u>	<u>Firing Sequences</u>	<u>No. of Firing Sequences/Riflemen</u>
1. Standing	Controlled Burst	Calibration	1 trigger pull of 3 rds each/pcint of aim	5
2. Standing	Controlled Burst	Sweep	4 trigger pulls of 3 rds each/sweep	5
3. Standing	Controlled Burst	Point	4 trigger pulls of 3 rds each/point of aim	5
4. Standing	Full Automatic	Sweep	1 burst of 12 rds/sweep	5
5. Standing	Full Automatic	Point	1 burst of 12 rds/point of aim	5
6. Prone	Controlled Burst	Calibration	1 trigger pull of 3 rds each/point of aim	5
7. Prone	Controlled Burst	Sweep	4 trigger pulls of 3 rds each/sweep	5
8. Prone	Controlled Burst	Point	4 trigger pulls of 3 rds each/point of aim	5
9. Prone	Full Automatic	Sweep	1 burst of 12 rds/sweep	5
10. Prone	Full Automatic	Point	1 burst of 12 rds/point of aim	5

b. Pseudo-Tactical Test

(1) General

- (a) Range: 100 meters
- (b) Number of Subjects: 9
- (c) Rounds/Subject: 900
- (d) Rounds/Magazine: 30

Each magazine was loaded with 30 rounds, regardless of the mode of fire, to provide at least 3 rounds per target exposed. Thirty rounds also provides for about 4 seconds of low-rate, full-automatic fire. Magazine changing time was not incorporated in either this subtest or the Verification Test. Each sequence was designed to be completed with the rounds of ammunition available in one magazine.

(e) Target Exposure Time

A 6-second exposure of the targets was selected to provide enough time to engage at least five targets with either the trigger manipulated, full-automatic burst or controlled burst. The number of targets engaged with the full automatic, extended burst depends upon the rate of weapon swing by the firer.

(2) Target Array

After considering possible enemy tactical formations, 10 silhouette targets were positioned 10 meters apart, and the test subjects were instructed to engage each target separately. The standard Day Assault and Day Defense Tests, already available at Fort Benning, were considered; however, after considering such factors as range scheduling, control and support personnel required, ammunition consumption, time required per subject, and the limitation considerations already discussed, these tests were eliminated. The type of data needed were such quantities as rate of target engagement, rate of target defeat, quantity of ammunition consumed per unit time, and total hits obtained. A simple line of pop-up silhouette targets would provide these data for comparative purposes.

(3) Detailed Plan

Pseudo-Tactical Test

<u>Position</u>	<u>Mode of Fire</u>	<u>No. of Sequences</u>
1. Supported	Controlled Burst	5
2. Supported	Trigger-manipulated burst	5
3. Supported	Full-automatic, extended burst	5
4. Standing	Controlled-burst	5
5. Standing	Trigger-manipulated burst	5
6. Standing	Full-automatic, extended burst	5

2. Conduct of Test

a. General

Details of the Verification and Pseudo-Tactical Tests are described to include method of data collection.

b. Verification Test

(1) Firing Positions

(a) Standing



Figure 4B. Standing position

When firing from the standing position, the front hand grip was loosely grasped with the left hand, and the rifle butt stock was held firmly against the center of the right shoulder. Care was taken not to allow the riflemen to rest the magazine on the palm of the left hand while firing; the feet were placed about 1 foot apart.

(b) Prone



Figure 5B. Prone position

Each subject assumed the standard prone position. The firer was instructed to grasp the front hand guard and not the magazine. No bipods or sandbags were used for weapon support.

(2) Firing Sequence

(a) Standing

1. Calibration

- a. Target: Calibration
- b. Mode Selected: Controlled burst
- c. Magazine Loading: 3 rounds per magazine
- d. Number of Sequences: 5

e. Sequence: The subject was instructed to fire one controlled burst at each cross. He was to place his shots as accurately as possible and was allowed as much time as desired.

f. Target Marking: The target was marked after five crosses had been fired upon.

2. Sweep

a. Target: Sweep

b. Mode Selected: Controlled burst

c. Magazine Loading: 12 rounds per magazine

d. Number of Sequences: 5

e. Sequence: The subject was instructed to commence firing on signal, using as his initial aim point the cross at the left end of the line. He was instructed to pull the trigger a total of four times while sweeping from left to right. He was to have both eyes open while firing and attempt to direct his fire as close to the line as possible. He was to attempt to fire at a rate of two to three trigger-pulls per second.

f. Target Marking: The target was marked after each sequence of 12 rounds.

3. Point

a. Target: Point

b. Mode Selected: Controlled burst

c. Magazine Loading: 12 rounds per magazine

d. Number of Sequences: 5

e. Sequence: The subject was instructed to commence firing on signal, using as his aim point the center of a selected cross. He was to pull the trigger a total of four times and to direct his fire as close to the center of the cross as possible. He was to have both eyes open while firing and attempt to fire at a rate of two to three trigger-pulls per second. One cross was fired upon per sequence.

f. Target Marking: The target was marked after each sequence of 12 rounds.

4. Sweep

- a. Target: Sweep
- b. Mode Selected: Full automatic
- c. Magazine Loading: 12 rounds per magazine
- d. Number of sequences: 5
- e. Sequence: The subject was instructed to

commence firing on signal, using the cross on the left end of the line as his initial aim point. He was instructed to pull the trigger only once while sweeping his fire across the panel from left to right. He was to have both eyes open while firing and attempt to direct his fire as close to the line as possible.

f. Target Marking: The target was marked after each sequence of 12 rounds.

5. Point

- a. Target: Point
- b. Mode Selected: Full automatic
- c. Magazine Loading: 12 rounds per magazine
- d. Number of Sequences: 5
- e. Sequence: The subject was instructed to

commence firing on signal, using as his aim point the center of a selected cross. He was instructed to pull the trigger only once and to direct his fire as close to the center of the cross as possible. He was to have both eyes open while firing. Each cross was fired upon only once.

f. Target Marking: The target was marked after each sequence of 12 rounds.

(b) Prone

The firing sequences followed were exactly the same as the standing position and will not be repeated here.

c. Pseudo-Tactical Test

(1) Firing Positions

(a) Supported



Figure 6B. Supported position

When firing from the supported position the foregrip was firmly grasped with the left hand and the left elbow rested on sand bags. The rifleman was allowed to lean against the forward edge of the foxhole.

(b) Standing

The standing position assumed during the Verification and Pseudo-Tactical Tests were identical; however, during this test, the rifleman fired while standing in a foxhole.

(2) Firing Sequence

(a) Supported

1. Controlled Burst

- a. Mode Selected: Controlled burst
- b. Magazine Loading: 30 rounds per magazine
- c. Number of Sequences: 5
- d. Target Exposure Time: 6 seconds

e. Sequence: The subject was instructed to commence firing as soon as the targets appeared. He was to engage the left-most target first, firing one burst at each target in an attempt to engage as many targets as time would permit.

2. Trigger-Manipulated Burst

- a. Mode Selected: Full automatic
- b. Magazine Loading: 30 rounds per magazine
- c. Number of Sequences: 5
- d. Target Exposure Time: 6 seconds
- e. Sequence: The subject was instructed to

commence firing as soon as the targets appeared. He was to engage the left-most target first and to fire a two to four-round burst of full-automatic fire at each target. He was to engage as many targets as time would permit.

3. Full Automatic, Extended Burst

- a. Mode Selected: Full automatic
- b. Magazine Loading: 30 rounds per magazine
- c. Number of Sequences: 5
- d. Target Exposure Time: 6 seconds
- e. Sequence: The subject was instructed to

commence firing when the targets appeared and use as his initial aim point the left-most target. He was to pull the trigger only once while sweeping his fire across the row of targets from left to right. Fire was to be directed at as many targets as the ammunition provided in the magazine and weapon controllability would allow.

(b) Standing

The firing sequences followed were exactly the same as for the supported position.

3. Data Collection

a. Verification Test

The panel targets were marked after each sequence. Each burst was assigned a reference number, and the number of rounds fired in that burst was recorded. The impact points were marked with a distinctive

symbol. Pertinent information was recorded on the panel so that the target could be easily identified. Upon completion of firing, each panel was photographed.

The x and y coordinates of each impact point were extracted from the photograph with the aid of a "Universal Telereader." For the point and calibration targets, the origin of the axis was the center of the cross. For the sweep-type targets, the origin was the cross at the left edge of the line. The telereader recorded the coordinates of each impact point on computer punch-cards.

This method of data collection has proven to be extremely useful. The method allows for the conduct of the test to be smooth and rapid. The photographs are a ready reference and a permanent record of the test. The individual photographs can be grouped in any manner desired for the purpose of either analyzing the test results or describing the conduct of the test. The telereader provides accurate, one-step conversion from photograph to punch-cards ready for computer input.

b. Pseudo-Tactical Test

This type of test necessitated that all targets be inspected for hits after each trial. The rounds fired, rounds per trigger-pull, seconds of engagement, individual targets fired at, targets hit, and number of hits per target were recorded. A tape recording of each trial was obtained for future reference. This recording provided a means for obtaining time of target engagement and a cross-check for determining the number of trigger-pulls and rounds per trigger-pull.

4. Data Reduction

a. Verification Test

In an attempt to establish some measure of dispersion to describe the lack of uniformity in a target pattern, several statistics were calculated. A computer program was written to calculate several descriptive measures which may be of interest. The coordinates of the impact points and a summary of the computations are presented in the tables of Appendix C. The reader will find the target photographs, included in Appendix D, helpful in picturing the patterns obtained.

(1) Statistics considered and computational forms.

(a) Average Extreme Spread (\bar{ES}) for the controlled-burst mode where extreme spread is the maximum distance between any two points of a burst.

(b) Miss Distance, the deviation, H , in the horizontal direction or deviation, V , in the vertical direction of the observed impact measured from the origin of the coordinate system. Miss distances are signed numbers (+ or -).

Note: Hereafter, only the symbols and formulas for the vertical direction will be listed. Corresponding formulas for the horizontal direction are to be understood.

(c) Average Miss Distance, \bar{V} , is the algebraic average of a collection of miss distances, V .

For the j^{th} burst,

$$\bar{V}_j = \frac{\sum_{i=1}^{N_j} i V_j}{N_j}$$

For a man,

$$\bar{V}_m = \frac{\sum_{j=1}^5 \bar{V}_j}{5}$$

Across men,

$$\bar{v} = \frac{\sum_{m=1}^{11} \bar{v}_m}{11}$$

(d) Absolute Miss Distance, $|v|$, is the positive value of the miss distance.

(e) Average Absolute Miss Distance, $\bar{|v|}$, for a collection of impact points is an average of the individual absolute miss distances.

For the j^{th} burst,

$$\bar{|v|}_j = \frac{\sum_{i=1}^{N_j} |i v_j|}{N_j}$$

For a man,

$$\bar{|v|}_m = \frac{\sum_{j=1}^5 \bar{|v|}_j}{5}$$

Across men,

$$\bar{|v|} = \frac{\sum_{m=1}^{11} \bar{|v|}_m}{11}$$

(f) Standard Deviation, S_v , is the square root of the average of the squares of deviations from the mean, $V - \bar{v}$. The symbol, σ , (sigma) will be used to denote averaged values of standard deviation, S .

For the j^{th} burst,

$$j S_v = \sqrt{\frac{N_j \sum_{i=1}^{N_j} i v_j^2 - \left(\sum_{i=1}^{N_j} i v_j \right)^2}{N_j(N_j - 1)}}$$

For a man,

$$m \sigma_v = \sqrt{\frac{(N_1-1)(1 S_v)^2 + (N_2-1)(2 S_v)^2 + \dots + (N_5-1)(5 S_v)^2}{N_1 + N_2 + \dots + N_5 - 5}}$$

Across men,

$$\sigma_v = \sqrt{\frac{\sum_{m=1}^{11} m \sigma_v^2}{11}}$$

(g) Standard Deviation, $S_{\bar{v}}$, of the average miss distances, \bar{v} .

For a man,

$$S_{\bar{v}} = \sqrt{\frac{5 \sum_{j=1}^5 \bar{v}_j^2 - \left(\sum_{j=1}^5 \bar{v}_j \right)^2}{20}}$$

Across men,

$$\sigma_{\bar{v}} = \sqrt{\frac{\sum_{m=1}^{11} m S_{\bar{v}}^2}{11}}$$

(h) Root Mean Square, V_{RMS} , is the square root of the average of the squares of the miss distances, V .

For the j^{th} burst,

$$V_{RMS} = \sqrt{\frac{\sum_{i=1}^{N_j} i v_j^2}{N_j}}$$

For a man,

$$m V_{RMS} = \sqrt{\frac{N_1 (1 V_{RMS})^2 + N_2 (2 V_{RMS})^2 + \dots + N_5 (5 V_{RMS})^2}{N_1 + N_2 + \dots + N_5}}$$

Across men,

$$V_{RMS} = \sqrt{\frac{\sum_{m=1}^{11} m V_{RMS}^2}{11}}$$

(2) Explanation of tables.

(a) Tables IV through VIII of Appendix C have the following layout and are a tabulation of the data described below for each item.

FIRER BURST		1	2	3	4	5	6	7	8	9	10	11	12
1	431	V											
		H											
	432	V											
		H											
	433	V					ITEM 1						
		H											
	434	V											
		H											
	435	V											
		H											
AVERAGE		V			ITEM 2								
STDDEV		V											
AVERAGE		H					ITEM 3						
STDDEV		H											

Figure 7B. Layout of tables IV through VIII

Item 1: The vertical V and horizontal H coordinates in mils of each round for each of the five bursts.

Item 2: The average miss distance and standard deviation in the vertical direction for all first rounds for each man, for all second rounds, for all third rounds, etc.

Item 3: The average miss distance and standard deviation in the horizontal direction for all first rounds, second rounds, third rounds, etc. Only the calibration and point targets are represented.

(b) Tables IX through XIII of Appendix C have the following layout and are a tabulation of those data described by each item. All measurements of dispersion are given in mils.

FIRER	BURST	AV V	SIG V	S V	AV AB V	VRMS	AV H	SIG H	S H
1	1								
	2								
	3	1	3		6	8	10	12	
	4								
	5								
	SUMMARY	2	4	5	7	9	11	13	14

Figure 8B. Layout of tables IX through XIII

- Item 1: Average vertical miss distance (\bar{V}) for each burst.
- Item 2: An average (\bar{V}) of the average vertical miss distances (\bar{V}) for each man.
- Item 3: Standard deviation (S_v) of the individual projectile miss distances (V) about the center of impact (V) for each burst.
- Item 4: An average (S_v) of the standard deviations (S_v) to obtain a representative value of single burst dispersion for each man.
- Item 5: Standard deviation ($S_{\bar{V}}$) of the average miss distances (\bar{V}) about their average (\bar{V}).
- Item 6: Average absolute vertical miss distance $|\bar{V}|$.
- Item 7: An average ($\bar{|\bar{V}|}$) of the average absolute vertical miss distance ($|\bar{V}|$) for each man.
- Item 8: Vertical root mean square (V_{RMS}) for each burst.
- Item 9: An average of the individual V_{RMS} 's to obtain a representative value for each man.
- Items 10 through 14: These items are included in the tables of data for calibration and point targets. The quantities presented are measures of horizontal dispersion and are calculated in the same manner as those presented in Items 1 through 5.

(c) The following additional tables are listed in Appendix C with all measurements of dispersion given in mils.

1. Table XIV. A summary of the dispersion data presented in tables IX through XIII, calculated across men.

2. Table XV. A listing of the extreme spread of each three-round controlled burst fired during the calibration portion of the verification test.

3. Table XVI. A summary table which compares the \overline{ES} of a three-round burst fired at approximately 450 spm to one fired at approximately 2000 spm.

4. Table XVII. Lists the extreme spread of each three-round burst fired at approximately 450 spm.

5. Table XVIII. Lists the extreme spread of each three-round burst fired at approximately 2000 spm.

6. Table XIX. The horizontal and vertical coordinates of each impact point of the three-round bursts of Table XVII.

7. Table XX. The horizontal and vertical coordinates of each impact point of the three-round burst of Table XVIII.

8. Table XXI. Provides a tabulation of the rounds fired, segments hit and total hits within the zone of consideration for the controlled-burst and full-automatic modes of fire.

9. Table XXII. Tabulates the number of segments within the zone of consideration which received multiple hits.

10. Table XXIII. A summary of the average trigger-pull rates of each individual rifleman during the applicable portions of the Verification and Pseudo-tactical tests.

11. Tables XXIV through XXVI. Provides a comprehensive tabulation of the Pseudo-tactical test data.

b. Pseudo-Tactical Test

To provide a basis for comparison between modes of fire, ratios were formed from such quantities as time of target engagement, rounds expended, targets engaged, targets hit and hits per target. Those data tabulated in Tables XXIV through XXVI in Appendix C were generated during this test. A summary of the ratios formed from the quantities is presented in Table II of Section IV.

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APPENDIX C

(CONFIDENTIAL) TABLES IV - XXVI, TABLES OF DATA

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65

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FIRER BURST		ROUND									
1	1V	5.9	4.1	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	4.3	0.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2V	-	8.1	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	3.3	-	2.8	1.3	0.0	0.0	0.0	0.0	0.0	0.0
3V	-	1.6	1.64	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	2.3	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4V	-	12.9	0.1	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	1.9	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5V	-	9.2	3.7	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	8.4	1.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE V		7.5	6.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV V		4.2	6.9	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE H	-	4.1	-	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV H		2.6	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1V	7.1	-	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	0.2	-	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0
2V	-	2.1	-	0.7	3.5	0.0	0.0	0.0	0.0	0.0	0.0
H	-	0.7	-	1.8	9.0	0.0	0.0	0.0	0.0	0.0	0.0
3V	-	0.8	-	0.3	3.2	0.0	0.0	0.0	0.0	0.0	0.0
H	-	1.4	-	2.2	6.4	0.0	0.0	0.0	0.0	0.0	0.0
4V	-	2.8	-	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	1.1	-	3.1	6.2	0.0	0.0	0.0	0.0	0.0	0.0
5V	-	3	-	0	3.2	0.0	0.0	0.0	0.0	0.0	0.0
H	-	0.1	-	0.7	6.1	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE V		7.2	-	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV V		4.0	1.1	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE H	-	6	-	1.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV H		0.7	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	1V	1.8	-	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H	-	1.2	-	0.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0
2V	-	7.6	-	0.8	7.3	0.0	0.0	0.0	0.0	0.0	0.0
H	-	2.6	-	0.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0
3V	-	7.5	-	0.5	2.1	0.0	0.0	0.0	0.0	0.0	0.0
H	-	1.4	-	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0
4V	-	1.6	-	1.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0
H	-	6.5	-	5.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0
5V	-	5.0	-	2.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
H	-	6.4	-	1.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE V		4.1	-	0.2	4.5	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV V		3.7	1.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE H	-	3.6	-	1.6	1.3	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV H		2.7	2.2	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Table IV (C). Miss Distance, Calibration, Standing (U)

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FIRER QURST	ROUND											
	6	7	8	9	10	11	12	13	14	15	16	17
4	1V -	2.2 -	2	3	4	5	6	7	8	9	10	11
H -	.6 -	.2 -	3.9 -	6.1 -	.0	.0	.0	.0	.0	.0	.0	.0
2V -	2.1 -	2.9 -	3.5 -	1.7 -	.0	.0	.0	.0	.0	.0	.0	.0
H -	3.4 -	2.8 -	.7	3.5 -	.0	.0	.0	.0	.0	.0	.0	.0
3V -	5.9 -	7.1 -	4.4 -	1.0 -	.0	.0	.0	.0	.0	.0	.0	.0
H -	2.7 -	.5 -	1.0 -	3.5 -	.0	.0	.0	.0	.0	.0	.0	.0
4V -	1.9 -	1.0 -	3.5 -	1.0 -	.0	.0	.0	.0	.0	.0	.0	.0
H -	2.5 -	.4 -	1.0 -	1.0 -	.0	.0	.0	.0	.0	.0	.0	.0
5V -	5.1 -	3.4 -	3.1 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	4.1 -	2.3 -	1.8 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
AVERAGE V -	3.5 -	3.7 -	4.1 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV V	1.9	2.2	1.2	.0	.0	.0	.0	.0	.0	.0	.0	.0
AVERAGE H -	2.6 -	1.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV H	1.3	1.4	1.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
5	1V -	6.5 -	2.5 -	.8	.0	.0	.0	.0	.0	.0	.0	.0
H -	5.0 -	3.7 -	2.4 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
2V -	2.8 -	6.0 -	2.1 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	2.6 -	1.9 -	.0	1.0 -	.0	.0	.0	.0	.0	.0	.0	.0
3V -	4.0 -	.7 -	.6 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	5.7 -	1.7 -	1.1 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
4V -	.6 -	5.6 -	2.9 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	2.1 -	1.7 -	.9 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
5V -	.4 -	3.5 -	.6 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	1.6 -	1.5 -	2.6 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
AVERAGE V -	.9 -	1.2 -	1.2 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV V	4.0	4.5	1.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
AVERAGE H -	3.4 -	1.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV H	1.8	1.9	1.9	.0	.0	.0	.0	.0	.0	.0	.0	.0
6	1V -	9.5 -	5.6 -	3.1 -	.0	.0	.0	.0	.0	.0	.0	.0
H -	.3 -	.9 -	4.4 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
2V -	1.8 -	7.2 -	1.6 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	4.0 -	1.8 -	3.7 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
3V -	2.6 -	6.9 -	2.1 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	1.2 -	1.4 -	4.9 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
4V -	3.4 -	1.1 -	1.4 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	2.7 -	.6 -	3.8 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
5V -	4.3 -	7.2 -	1.1 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
H -	1.0 -	1.2 -	5.4 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
AVERAGE V -	4.3 -	5.6 -	.9 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV V	3.0	2.6	2.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
AVERAGE H -	.8 -	.5 -	.4 -	.0	.0	.0	.0	.0	.0	.0	.0	.0
STD DEV H	2.4	1.3	.7	.0	.0	.0	.0	.0	.0	.0	.0	.0

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Table IV (C). Miss Distance, Calibration, Standing (Continued) (II)

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FIRER BURST	ROUND											
	6	7	8	9	10	11	12	13	14	15	16	17
7 IV -	1.2	2	3	4	5	6	7	8	9	10	11	12
H -	.4	-	1.1	1.7	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8
2V -	.2	2.2	2.0	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
H -	2.6	-	.5	.1	.0	.0	.0	.0	.0	.0	.0	.0
3V -	1.9	-	.2	.6	.0	.0	.0	.0	.0	.0	.0	.0
H -	4.3	-	.5	.7	.0	.0	.0	.0	.0	.0	.0	.0
4V -	.5	1.3	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	.6	-	2.5	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5V -	8.6	-	.3	.1	.0	.0	.0	.0	.0	.0	.0	.0
H -	1.1	-	1.1	.5	.0	.0	.0	.0	.0	.0	.0	.0
AVERAGE V	1.0	2.2	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV V	4.3	2.6	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE H	1.6	-	.9	.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV H	1.8	1.1	.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8 IV -	4.9	-	6.3	2.8	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
H -	.4	-	.7	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2V -	.1	-	4.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	1.3	-	2.4	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3V -	2.9	-	2.5	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	1.3	-	1.8	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4V -	.4	-	5.1	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	2.1	-	5.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5V -	7.7	-	4.6	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	3.7	-	4.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE V	3.0	-	4.6	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV V	3.4	1.4	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE H	1.6	-	2.9	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV H	2.5	1.9	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9 IV -	4.6	-	.5	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	2.4	-	1.2	.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2V -	.4	-	2.3	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	3.3	-	2.5	.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3V -	2.9	-	8.3	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	.1	-	2.1	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4V -	3.1	-	.9	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	1.1	-	.4	.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5V -	1.5	-	.6	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
H -	.3	-	.3	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE V	.6	-	2.3	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV V	2.2	3.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVERAGE H	1.4	-	.1	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
STD DEV H	1.4	1.8	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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Table IV (C). Miss Distance, Calibration, Standing (Continued) (u)

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FIRER BURST		ROUND											
		1	2	3	4	5	6	7	8	9	10	11	12
10	1V	3.9	4.3	5.6	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	2.7	3.1	•3	•0	•0	•0	•0	•0	•0	•0	•0	•0
	2V	3.1	8.1	3.9	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	2.8	2.4	1.7	•0	•0	•0	•0	•0	•0	•0	•0	•0
	3V	3.2	•9	2.5	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	1.4	2.9	3.3	•0	•0	•0	•0	•0	•0	•0	•0	•0
	4V	6.5	2.2	1.0	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	5.0	1.5	1.8	•0	•0	•0	•0	•0	•0	•0	•0	•0
	5V	2.4	1.1	2.5	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	1.1	1.3	5.0	•0	•0	•0	•0	•0	•0	•0	•0	•0
	AVERAGE V	3.8	•8	1.3	•0	•0	•0	•0	•0	•0	•0	•0	•0
	STD DEV V	1.6	4.7	3.8	•0	•0	•0	•0	•0	•0	•0	•0	•0
	AVERAGE H	1.8	•6	1.7	•0	•0	•0	•0	•0	•0	•0	•0	•0
	STD DEV H	2.9	2.6	2.6	•0	•0	•0	•0	•0	•0	•0	•0	•0
11	1V	2.0	1.6	•0	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	3.1	2.0	•0	•0	•0	•0	•0	•0	•0	•0	•0	•0
	2V	1.4	1.1	3.4	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	1.5	•6	2.1	•0	•0	•0	•0	•0	•0	•0	•0	•0
	3V	1.3	3.0	3.4	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	1.2	2.8	1.9	•0	•0	•0	•0	•0	•0	•0	•0	•0
	4V	2.9	1.2	2.3	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	3.5	•4	1.1	•0	•0	•0	•0	•0	•0	•0	•0	•0
	5V	3.6	•1	3.9	•0	•0	•0	•0	•0	•0	•0	•0	•0
	H	•1	2.6	2.2	•0	•0	•0	•0	•0	•0	•0	•0	•0
	AVERAGE V	1.5	1.4	3.3	•0	•0	•0	•0	•0	•0	•0	•0	•0
	STD DEV V	2.1	1.0	•7	•0	•0	•0	•0	•0	•0	•0	•0	•0
	AVERAGE H	1.9	•1	1.8	•0	•0	•0	•0	•0	•0	•0	•0	•0
	STD DEV H	1.4	1.5	•5	•0	•0	•0	•0	•0	•0	•0	•0	•0

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Table IV (C). Miss Distance, Calibration, Standing (Continued) (U)

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FIREX BURST		ROUND											
		1	2	3	4	5	6	7	8	9	10	11	12
1	426V	5.8	-	2.2	-	3.3	1.3	-	2.1	12.7	7.7	5.2	16.2
	H	-	2.1	-	1.4	4.1	46.8	49.5	101.6	102.5	104.7	137.8	138.3
427V	.7	1.1	12.5	8.1	2.4	-	6.4	9.0	2.4	3.5	5.2	11.4	16.3
H	3.1	.3	5.8	56.0	54.3	57.5	105.5	107.3	107.8	133.8	134.1	137.1	
428V	2.5	-	4.6	4.3	-	5.5	1.3	4.1	3.3	16.7	9.6	1.1	-1.0
H	2.2	.8	4.9	0	52.2	60.3	101.7	103.0	104.4	136.3	139.1	139.6	
429V	-	3.0	-	1.8	-	2.0	4.1	-	1.2	2.5	5.6	9.8	0
H	2.0	1.8	-	2.9	52.8	52.0	110.2	112.2	132.9	134.6	134.6	134.6	
430V	5.5	3.3	-	3.8	1.5	1.4	6.5	1.8	-	12.0	1.4	1.1	-3.6
H	1.3	-	12.0	46.9	46.5	53.0	103.8	104.5	106.9	141.4	141.7	146.7	
AVERAGE V	2.3	-	7	-	2	1.6	4	-	9	5.8	1.7	7.6	5.7
STD DEV V	3.6	1.4	-	7.2	4.8	1.5	5.3	4.5	4.8	6.7	4.6	5.6	10.2
2	186V	-	8.7	-	5.1	-	4.0	2	-	3.8	-	3.0	-
	H	-	3.5	-	1.7	35.7	36.8	37.2	79.0	84.9	87.0	124.6	122.8
187V	-	4.1	-	1.5	-	7.0	8	-	3.1	-	6.5	2.2	3.4
H	-	3.5	1.7	-	4.1	24.6	28.6	28.6	67.0	67.5	110.4	113.1	118.2
188V	-	1.9	-	1.1	-	6.6	2.8	-	1.8	-	7.3	3.3	1.8
H	.7	-	1.4	-	1.9	35.2	35.2	35.2	35.7	66.8	66.5	70.4	113.7
189V	.9	-	1.6	-	4.1	-	2.1	-	3.0	-	4.8	4.3	4.1
H	1.1	-	4	-	3.0	34.5	33.4	33.4	34.7	72.9	73.0	111.0	111.5
190V	1.9	.3	-	2.6	5.4	3.6	3.6	-	3.4	-	2.8	4.9	3.5
H	2.9	-	.6	-	2.0	33.3	31.2	31.2	37.2	55.0	69.5	69.5	69.5
AVERAGE V	-	1.8	-	1.8	-	4.1	.6	-	1.1	-	2.8	-	3.5
STD DEV V	4.1	2.0	-	2.9	3.8	3.0	1.9	5.0	2.8	3.8	4.5	6.6	3.7
3	306V	5.7	-	1.6	2.8	1.5	2.7	-	1.7	-	7	-	1.5
	H	5.0	2.6	-	7.3	37.4	41.1	42.3	85.6	86.3	122.9	122.8	126.5
307V	-	4.3	-	2.6	-	4	6.6	-	8.7	-	2.8	1.5	0
H	6.9	8.4	-	9.7	46.5	53.6	56.6	101.1	104.5	108.0	108.0	108.0	0
308V	4.0	3.3	-	4.5	13.5	5.4	13.7	-	1.3	1.9	9.0	-	1.4
H	9.9	11.8	-	13.6	34.4	40.7	42.8	68.8	70.0	69.8	111.2	112.7	120.8
309V	-	4.7	-	2.3	1.2	5.9	10.9	-	7.5	-	12.3	8.5	4.2
H	5.2	7	-	5.4	35.4	36.2	39.0	65.6	66.7	74.0	120.7	122.6	127.5
310V	-	8	-	3.1	-	6.0	-	9	4.9	-	8.9	2.4	10.7
H	3.9	6.9	-	8.1	30.9	29.0	30.7	76.4	79.6	85.0	118.2	117.9	123.6
AVERAGE V	-	5	-	2.4	1.8	6.4	4.9	-	2.7	-	3.5	2.9	5.2
STD DEV V	6.2	-	2.4	1.8	6.9	5.2	7.0	-	6.6	5.4	7.1	5.2	1.6

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Table V (C). Miss Distance, Sweep, Controlled Burst, Standing (U)

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FIRER SURST		ROUND											
		1	2	3	4	5	6	7	8	9	10	11	12
4	226V	2.1	•7	1.0	2.5	2.9	1.9	.1	2.3	3.5	9.4	5.8	7.1
H	10.2	12.4	14.5	27.1	39.0	61.1	62.4	64.9	70.5	81.7	107.0	107.0	107.0
227V	-	4.9	6.2	9.6	5.6	7.6	6.0	15.0	19.3	6.9	4.4	8.4	10.8
H	13.5	14.3	20.8	58.4	62.0	64.3	95.6	97.4	10.9	144.0	143.7	143.7	145.3
228V	-	7.7	7.5	4.8	14.7	19.4	16.4	15.8	15.1	9.4	13.6	7.2	8.0
H	2.7	2.7	4.8	48.9	50.8	57.0	88.3	87.3	90.8	124.3	126.6	129.8	129.8
229V	-	7.3	10.6	6.8	11.3	20.0	19.1	5.6	8.6	12.8	1.5	5.5	0.0
H	3.5	11.9	11.4	72.7	73.6	75.8	97.4	100.1	104.1	143.2	143.4	143.4	143.4
230V	-	9.4	13.6	11.3	6.8	5.0	4.1	13.8	11.7	8.7	8.8	9.7	12.1
H	7.6	12.0	15.2	35.8	35.6	36.6	72.5	73.0	78.6	125.2	124.9	127.6	127.6
AVERAGE V	-	5.4	7.4	6.3	7.4	9.6	8.7	10.0	10.5	6.9	3.8	7.3	7.3
STD DEV V	4.5	5.4	4.8	6.5	9.8	8.8	7.0	8.2	6.2	8.7	1.8	5.8	5.8
5	466V	10.3	5.9	4.7	6.7	6.3	11.2	9.6	6.0	1.8	3.6	10.9	13.6
H	2.6	2.7	7.2	26.8	28.9	31.0	57.9	60.9	62.3	106.4	111.1	115.8	115.8
467V	-	3.5	10.4	11.9	1.7	7	5	11.1	19.0	11.5	13.3	12.7	9.8
H	3.3	2.5	4.3	39.0	39.5	40.0	70.4	71.2	74.4	105.6	105.9	108.4	108.4
468V	-	3.3	8.6	4.8	15.9	18.1	8.5	15.6	11.3	16.7	16.7	11.5	11.5
H	3.9	3.3	5.7	48.0	48.9	51.1	73.2	78.4	85.9	103.9	106.1	111.5	111.5
469V	-	9.2	11.9	5.4	6.4	3.3	1.6	12.8	17.4	18.6	31.5	20.5	14.3
H	4.4	5.9	6.6	34.0	37.7	40.0	58.0	62.3	67.4	102.4	102.8	103.5	103.5
470V	-	11.5	11.1	5.2	23.4	13.4	28.2	4.1	14.4	16.8	2.8	6.6	12.7
H	1.0	3.7	7.2	27.1	29.6	31.1	65.2	64.3	65.2	80.5	87.3	93.8	93.8
AVERAGE V	-	9.4	9.6	6.4	10.8	8.1	9.3	10.7	14.0	12.0	13.6	13.9	12.4
STD DEV V	3.1	2.4	3.1	8.7	7.6	11.8	4.3	5.0	6.5	11.7	4.7	1.8	1.8
6	266V	•2	•8	3.7	1.0	3.9	3.8	2.5	1.9	8.2	•9	4.6	0.0
H	3.5	2.5	5	20.7	22.2	26.2	67.6	69.7	69.8	118.8	123.5	0.0	0.0
267V	-	1.9	2.0	3.5	1.1	7.7	7.8	6.0	9.9	6.0	6.5	3.4	5.5
H	3.0	•7	•9	32.1	31.9	34.6	66.7	69.4	70.9	107.2	108.1	106.8	106.8
268V	-	•9	6.7	7.7	10.7	5.4	1.3	4.0	•4	1.9	5.1	9.2	9.2
H	3.4	3.0	1.6	12.5	16.6	24.0	35.1	36.1	38.0	69.8	71.3	72.7	72.7
269V	-	7.6	4.7	6.0	10.3	13.5	16.5	13.0	9.8	6.6	2.0	3.2	6.2
H	1.9	1.2	2.0	29.8	31.2	35.0	81.1	83.7	84.2	111.2	114.2	114.2	114.2
270V	-	1.7	7.6	10.8	15.1	12.1	11.3	6.6	4.2	5.3	2.8	3.9	1.9
H	1.4	1.0	2.5	20.1	24.9	25.1	49.4	52.0	53.6	93.8	96.5	96.5	96.5
AVERAGE V	-	2.5	4.4	6.3	7.6	6.9	8.1	1.2	•5	•3	•3	•2	0.0
STD DEV V	3.0	2.9	3.0	6.3	6.9	6.0	8.1	7.3	6.7	5.3	4.5	5.3	5.3

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Table V (C). Miss Distance, Sweep, Controlled Burst, Standing (Continued) (U)

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FIRER PURT	7	ROUND										11	12
		1	2	3	4	5	6	7	8	9	10		
146V	2.9	2.3	2.0	3.8	4.4	5	6	7	8	9	10	2.8	7.4
STU DEV V	5.7	8.3	13.4	29.2	30.9	31.5	63.6	62.1	65.0	94.4	88.6	95.2	
147V	-	6.2	8.2	5.4	5.4	1.1	7.0	5.2	4.7	2.2	3.9	-	-7
STU DEV V	6.5	9.5	41.1	45.6	51.9	58.6	61.8	86.7	95.0	103.0			
148V	-	5.1	5.6	14.6	14.5	19.6	13.8	8.9	11.7	8.8	3.1	-	9.5
STU DEV V	11.4	12.0	13.8	38.4	35.2	40.0	51.3	51.3	74.2	75.1	82.0		
149V	-	4.1	5.2	6.6	15.4	16.9	14.1	7.2	4.5	10.2	5.7	-	4.4
STU DEV V	10.6	9.9	11.7	38.8	42.0	45.0	49.8	56.0	58.0	85.9	92.1	111.2	
150V	-	3.3	1.0	3.7	2.2	2.2	2.4	1.6	3.8	5	0	0	0
STU DEV V	9.7	10.4	11.8	50.4	54.5	60.3	92.4	92.3	101.4	0	0		
AVERAGE V	-	2.0	3.6	5.2	5.6	7.8	7.9	3.1	3.7	1.1	0.2	-	1.8
STD DEV V	3.1	2.9	2.4	9.0	7.8	9.0	11.8	8.8	9.2	6.2	4.0	-	7.1
b	346V	4.3	5.1	7.6	4.7	7.2	8.2	7.0	4.7	7	16.0	-	4.4
STU DEV V	1.3	1.4	6.4	21.3	25.0	24.9	59.2	60.0	59.6	7.1	101.5	102.2	
347V	-	4.2	7.2	14.4	17.7	13.0	10.7	7.7	3.7	-	14.1	-	13.6
STU DEV V	1.8	5.5	2.4	25.9	26.5	27.6	66.9	68.3	73.1	4.4	104.4	138.2	
348V	-	2.8	4.4	16.3	11.5	2.6	11.4	5.8	-	-	11.9	-	1.9
STU DEV V	3.2	8	1.6	16.1	16.0	19.8	46.8	48.6	53.6	95.5	96.3	-	0
349V	-	5	2.1	4.2	44.8	44.2	46.0	11.9	13.4	10.7	6.2	-	11.5
STU DEV V	1.8	5.9	2.5	4.5	4.1	2.1	30.5	29.4	25.0	-	4.4	-	0
350V	-	2.1	2.5	48.3	48.5	51.2	80.7	80.9	84.9	112.7	117.7	118.0	
AVERAGE V	-	2.2	4.2	4.8	3.5	2.7	1.5	14.6	6.9	10.3	7.5	-	5.7
STD DEV V	2.2	2.0	2.6	11.6	13.7	9.7	9.2	10.2	10.5	4.4	5.6	-	7.4
9	106V	3	1.7	5.2	9	2.6	3.6	3.9	2.5	0	0	-	0
STU DEV V	4.2	3.1	4	31.3	33.4	34.2	77.2	83.8	0	0	0	-	0
107V	-	7	3.0	3.6	7.4	3	11.6	6.4	5.3	5.5	11.0	-	0
STU DEV V	1.8	3.1	2.6	45.7	47.9	98.2	92.5	93.0	99.2	128.5	0	-	0
108V	-	2.6	3.1	8.3	2.1	6.7	10.4	4.0	7.8	8.5	13.0	-	14.6
STU DEV V	4.4	5	4.0	36.8	39.1	39.8	84.9	93.4	119.9	116.2	121.2	-	0
109V	-	3.5	2.9	3.3	25.5	8.6	12.9	9.4	8.9	0	0	-	0
STU DEV V	2.2	1.0	1.4	24.9	42.0	43.8	83.7	85.9	0	0	0	-	0
110V	-	2.2	4.9	6.0	3.2	1.1	12.7	5.9	4.5	1.1	1.8	-	8.9
STU DEV V	2.6	.1	2.2	47.1	44.3	48.7	81.5	86.0	85.7	119.2	123.2	126.3	
AVERAGE V	-	1.1	5.1	3.0	3.0	3.3	1.9	0.6	3.2	1.0	8.2	-	8.9
STD DEV V	1.8	2.5	2.0	13.2	4.6	9.6	8.7	7.2	6.8	12.0	9.1	0	

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Table V (C). Miss Distance, Sweep, Controlled Burst, Standing (Continued) (U)

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FIREX BURST		ROUND													
		1	2	3	4	5	6	7	8	9	10	11	12		
10	386V	-	1.1	2.1	4.8	5.4	3.4	2.1	-	9.9	-	12.9	8.2	6.9	
	H	-	1.6	17.9	16.0	50.7	57.0	58.6	59.6	103.8	101.6	132.8	134.5	0.0	
397V	-	3.9	1.3	3.0	-	4.8	-	5.2	-	1.8	15.1	15.1	19.3	0.0	
	H	-	10.9	13.2	14.3	70.6	78.4	78.6	88.6	94.8	95.9	0.0	0.0	0.0	
388V	-	1.2	-	3.8	-	6.8	1.4	-	1.6	5.5	-	5.4	-	2.6	
	H	-	4.5	5.8	8.2	35.3	38.0	39.9	89.1	89.2	92.3	118.8	121.8	0.0	
389V	-	5.5	1.2	-	2.2	-	0.3	-	0.2	1.2	-	8.1	-	4.0	
	H	-	11.1	14.9	17.6	57.5	61.6	62.5	106.6	113.6	113.6	0.0	0.0	0.0	
390V	-	4.6	-	4.7	-	6.7	35.4	30.7	28.1	-	14.5	-	16.2	-	
	H	-	7.8	13.3	12.9	27.9	32.7	33.1	82.6	83.5	84.3	101.8	103.3	8.6	
AVERAGE V	-	3.3	-	7.7	-	1.6	7.5	5.4	6.0	-	1.8	-	4.8	4.7	
STD DEV V	-	2.1	-	3.3	-	5.4	16.0	14.5	12.4	11.1	11.8	14.4	8.4	7.0	
11.	506V	-	1.0	-	1.0	-	1.2	6.6	5.8	7.4	1.1	-	6.2	5.2	3.1
	H	-	4.6	-	4.1	-	1.0	28.5	31.1	31.7	70.5	74.8	75.3	107.0	110.2
507V	-	0.1	-	6.0	3.1	-	8.7	-	4.6	3.6	-	10.6	-	111.4	
	H	-	1.0	-	1.2	6.1	22.1	24.6	24.4	65.8	66.4	66.4	11.3	-	
508V	-	1.7	-	0.9	-	1.9	-	5.6	-	7.5	-	5.3	-	2.2	
	H	-	0.3	-	1.0	-	3.9	17.5	19.8	22.0	56.1	56.4	7.8	92.4	95.9
509V	-	1.6	-	1.2	-	3.4	-	1.1	-	2.4	-	5.8	-	0.0	
	H	-	2.8	-	2.8	-	1.2	21.2	21.6	21.5	42.5	46.4	47.0	85.8	85.8
510V	-	1.5	-	1.2	-	1.5	-	10.9	-	9.5	-	13.7	-	3.8	
	H	-	1.0	-	1.2	16.5	19.7	23.2	24.7	66.3	68.4	69.5	90.9	92.4	
AVERAGE V	-	0.5	-	1.9	-	4.4	-	3.1	-	4.6	-	5.5	-	3.5	
STD DEV V	-	1.3	-	2.8	-	2.6	7.0	5.7	7.7	5.8	-	2.0	-	4.5	

CONFIDENTIAL

Table V (C). Miss Distance, Sweep, Controlled Burst, Standing (Continued) (U)

CONFIDENTIAL

		ROUND														
		1					2					3				
		FIRER BURST		1		2		3		4		5		6		
		1	2	3	4	5	6	7	8	9	10	11	12			
1	421V	3.4	-	4.3	-	9.2	-	4.7	-	13.8	-	6.4	8.9	7	0	
	H	•.9	2.5	20.9	51.4	85.5	106.4	122.2	124.6	124.6	124.6	124.6	124.6	124.6	0	
422V	1.6	6.8	8.1	-	1.7	-	4.3	3.3	9.4	8.0	12.1	10.7	-	0	0	
H	•.5	7.2	16.8	38.6	58.1	79.6	89.3	90.6	104.1	103.5	120.1	129.2	129.2	129.2	7	
423V	-	2.9	1.8	-	3.1	4.5	6.4	-	3.7	2.3	4.8	6.0	-	2.5	9.0	
H	-	2.2	7.7	10.6	23.6	36.1	46.4	60.6	79.5	89.5	96.3	110.2	118.4	118.4	0	
424V	-	1.4	-	5.7	10.3	5.2	5.4	•.3	5.4	4.9	7.8	-	14.2	-	2.9	
H	-	•.0	1.0	8.2	18.1	26.5	45.5	64.9	74.2	88.2	91.4	103.1	113.5	113.5	113.5	
425V	-	•.9	-	14.1	1.6	19.8	-	14.9	-	9.3	•.8	2.7	6.8	-	5.7	
H	2.1	9.7	11.3	32.9	47.8	66.6	78.6	92.6	104.7	116.8	119.4	119.4	119.4	119.4	9	
AVERAGE V	-	•.2	-	3.1	-	2.6	-	3.3	-	4.2	-	2.6	5.4	2.3	2.9	
STD DEV V	2.6	7.9	7.7	10.1	10.2	5.2	3.8	4.8	9.6	10.3	7.3	8.8	8.8	1.4	0	
2	181V	1.6	4.1	15.2	-	13.2	-	26.8	-	23.1	-	13.0	-	4.6	-	10.1
H	3.9	10.8	37.4	71.2	91.1	101.9	109.9	121.6	140.0	140.0	140.0	140.0	140.0	140.0	0	
182V	-	1.6	8.1	17.4	14.3	15.0	8.3	10.4	12.5	10.0	16.2	17.0	17.0	17.0	13.2	
H	6.6	9.5	35.7	48.7	53.4	59.7	62.1	68.9	102.6	126.3	132.0	137.7	137.7	137.7	0	
183V	-	1	9.3	13.9	10.2	10.2	2.9	5.4	-	2.2	5.2	-	2.3	-	9.1	
H	-	4.6	7.5	16.5	25.3	34.6	42.8	73.3	77.6	92.4	111.6	113.7	113.7	113.7	1.6	
184V	-	2.9	7.6	19.3	14.7	12.2	-	6.5	5.1	8.1	1.5	19.6	18.7	18.7	0	
H	3.3	5.7	19.8	37.1	57.6	78.0	92.3	102.1	118.7	130.1	137.4	146.3	146.3	146.3	0	
185V	-	•.5	7.7	12.6	-	6.0	•.7	25.9	9.0	64.3	1.8	-	1.3	-	0	
H	•.4	8.9	12.8	31.1	51.1	82.1	82.8	104.5	112.5	133.4	0	0	0	0	0	
AVERAGE V	-	•.5	7.3	15.7	1.4	-	2.6	1.5	3.4	4.1	1.7	3.5	9.2	10.1	0	
STD DEV V	1.8	1.9	2.7	11.3	17.0	18.1	9.4	7.1	7.4	8.6	15.9	10.5	10.5	10.5	0	
3	301V	-	5.7	5.6	5.8	1.8	1.7	10.0	12.4	18.2	0	0	0	0	0	0
H	3.5	10.4	30.4	53.4	80.3	97.5	116.1	138.9	138.9	138.9	138.9	138.9	138.9	138.9	0	
302V	-	2.1	1.9	-	5.6	5.2	•.4	10.4	11.4	12.4	10.8	10.8	10.8	10.8	0	
H	1.7	6.6	13.4	28.1	52.5	71.2	85.7	96.4	111.1	127.7	127.7	127.7	127.7	127.7	0	
303V	-	8.7	1.2	-	6.6	10.4	-	8.0	-	4.3	-	2.7	-	1.6	0	
H	1.9	6.7	12.6	28.8	52.4	72.9	82.0	93.8	104.6	120.3	120.3	120.3	120.3	120.3	0	
304V	-	1.1	-	2.5	11.3	-	2.4	3.4	3.4	8.2	9.2	14.6	13.0	10.9	0	
H	-	•.5	6.8	16.5	32.0	49.1	65.7	77.7	91.8	99.5	113.2	123.8	138.3	138.3	0	
305V	-	•.0	3.5	11.6	-	13.9	-	3.6	-	2.3	2.4	2.8	4.0	4.2	•.6	
H	-	1.9	12.3	23.0	32.2	40.2	49.3	59.5	70.2	83.6	88.9	95.6	95.6	95.6	0	
AVERAGE V	-	3.5	1.9	-	5.9	6.0	-	1.4	3.4	5.3	7.0	6.2	6.4	6.6	5.1	
STD DEV V	3.6	3.0	7.1	6.2	4.5	6.8	6.4	8.9	4.4	6.3	6.3	6.3	6.3	6.3	0	

CONFIDENTIAL

Table VI (C). Miss Distance, Sweep, Full Automatic, Standing (U)

CONFIDENTIAL

		FIRER RURSET		ROUND			
				7		11	
				6		12	
4	221V	6.4	11.4	8.6	15.8	20.1	0.0
	H	10.6	26.3	50.7	81.4	120.7	0.0
222V	-	8.1	4.4	6.6	2.7	6.7	0.0
	H	17.5	21.9	36.2	47.7	73.2	0.0
223V	-	1.0	3.4	5.5	4.6	6.8	0.0
	H	5.5	16.1	32.6	40.9	55.3	0.0
224V	-	4.7	3.7	4.0	3.8	5.3	0.0
	H	5.7	17.4	42.6	58.1	77.3	0.0
225V	-	3.5	6.4	8.6	18.1	4.7	0.0
	H	8.6	19.1	27.5	29.4	41.7	0.0
AVERAGE	V	4.7	4.4	5.1	7.2	4.0	0.0
STD DEV	V	2.7	5.5	5.2	9.6	8.0	0.0
5	461V	3.5	3.4	7.8	6.5	8	0.0
	H	5.2	9.6	21.7	39.0	52.5	0.0
462V	-	5.2	10.7	23.7	20.6	9.4	0.0
	H	3.5	15.7	21.8	41.8	62.4	0.0
463V	-	1.2	4.3	6.4	19.5	14.6	0.0
	H	3.4	25.4	35.7	37.2	55.8	0.0
464V	-	4.3	8.8	8.0	9.6	3.3	0.0
	H	1.8	18.2	24.0	26.9	32.6	0.0
465V	-	3.5	5.9	13.4	32.2	44.7	0.0
	H	1.3	22.3	33.3	38.2	46.0	0.0
AVERAGE	V	3.5	4.3	10.3	13.9	14.6	0.0
STD DEV	V	1.5	5.8	8.9	16.0	17.7	0.0
6	261V	6.5	6.2	5.7	14.1	26.7	27.5
	H	2.0	5.7	17.7	41.9	71.8	99.7
262V	-	9.7	17.9	26.2	7.8	12.4	12.0
	H	1.5	8.7	17.3	39.9	67.7	87.6
263V	-	11.7	20.1	31.5	12.1	2.2	5
	H	3.5	1.2	5.0	16.6	41.0	56.1
264V	-	2.0	1.1	7.3	7.5	10.4	11.9
	H	1.9	4.4	1.5	11.7	23.5	34.9
265V	-	4.6	5.3	4.6	5.5	8.8	7.8
AVERAGE	V	6.7	7.8	13.2	10.4	11.2	10.6
STD DEV	V	3.9	11.1	15.1	10.7	10.3	10.2

CONFIDENTIAL

Table VI (C). Miss Distance, Sweep, Full Automatic, Standing (Continued) (U)

CONFIDENTIAL

FIRER BURST	ROUND											
	1	2	3	4	5	6	7	8	9	10	11	12
7 141V	1.5	2.9	10.3	16.7	14.3	12.8	14.0	8.9	0.0	0.0	0.0	0.0
H	1.0	10.1	35.8	52.7	76.7	95.6	111.1	113.6	115.6	0.0	0.0	0.0
142V	-	5.2	2.6	14.3	10.0	6.1	-	5.2	15.9	6.1	4.9	11.6
H	-	9	8.4	17.2	31.9	41.0	47.9	49.0	45.0	69.3	100.8	120.0
143V	-	9.8	8.8	18.3	18.3	8.3	-	8.4	4.4	11.9	8.9	12.8
H	-	7	6.9	16.1	30.0	41.0	47.5	47.7	59.9	83.4	101.8	126.0
144V	-	2.2	12.0	13.3	12.1	7.9	2.3	3.3	3.3	8.0	0.0	0.0
H	-	6.7	11.9	22.0	41.9	60.6	76.9	93.0	121.1	140.5	0.0	0.0
145V	-	1.2	3.9	15.4	5.2	2.7	-	6.6	1.6	6.0	3.9	3.1
H	2.8	13.7	31.5	56.1	61.3	69.3	84.4	101.2	115.8	126.0	137.4	0.0
AVERAGE V	-	3.6	5.3	12.9	7.1	-	0.6	1.3	4.1	4.1	2.0	5.5
STD DEV V	4.1	5.1	5.9	10.8	10.7	8.3	5.6	11.7	7.9	2.8	5.5	1.5
8 341V	-	5.4	2.9	4.9	13.4	16.3	10.7	6.5	-	0	0	0
H	-	2.4	13.9	27.2	49.1	78.7	108.1	125.0	-	0	0	0
342V	-	7.7	5.6	17.1	18.8	19.8	-	27.6	-	10.2	7.1	10.5
H	-	1.0	9.4	11.4	23.8	48.0	80.7	105.5	116.4	126.6	127.1	132.0
343V	-	9.8	2.9	9.0	21.1	38.7	72.0	102.4	-	3.3	12.4	15.7
H	-	2.9	9.6	21.1	38.7	58.9	79.0	92.9	96.4	93.6	101.5	123.6
344V	-	1.6	1.4	16.8	10.2	1.2	-	7	4.8	15.4	17.6	2.0
H	-	2.2	2.9	10.0	21.0	33.5	50.2	62.2	70.2	80.4	100.1	114.3
345V	-	9.9	7.6	18.8	17.8	9.8	-	6.9	1.9	0.0	0.0	0.0
H	4.0	7.6	11.4	24.2	33.6	42.4	52.0	52.0	0.0	0.0	0.0	0.0
AVERAGE V	-	6.9	4.1	11.4	7.1	-	2.7	5.3	9.6	12.4	5.6	10.3
STD DEV V	3.5	2.5	9.3	13.3	13.5	14.0	12.4	6.1	5.2	8.8	8.3	0.0
9 101V	-	2.5	3.0	1.1	2.7	9.7	6.0	6.4	0	8.6	3.5	11.3
H	-	7.0	4.8	16.5	31.7	54.1	68.6	82.5	103.1	120.5	123.3	130.1
102V	-	1.3	3.5	16.5	17.3	7.5	7.1	10.2	-	2.1	11.0	15.4
H	-	8	7.4	15.5	27.5	41.0	55.3	69.0	86.2	108.8	132.4	0.0
103V	-	2.1	5.2	19.3	22.6	19.5	15.6	16.3	14.7	14.0	11.6	4.3
H	-	1.9	10.5	28.8	44.3	51.3	57.6	70.3	83.9	100.6	110.6	115.0
104V	-	0.7	1.8	1.9	7.6	5.8	-	1.3	6	4.5	6.9	1.1
H	-	12.4	8.1	1.9	12.2	26.0	40.5	54.8	72.0	87.5	100.7	112.7
105V	-	2.2	3.5	4.6	7.8	-	8	5.0	11.1	9.0	8.6	8.3
H	-	12.9	1.9	17.0	35.7	54.3	66.9	72.3	82.4	101.3	116.5	134.7
AVERAGE V	-	1	1.0	1.9	3.0	6.5	8.9	4.2	1.0	-	1.1	1.8
STD DEV V	2.1	4.0	12.9	15.4	11.4	6.1	5.9	7.3	10.4	11.2	8.5	12.4

CONFIDENTIAL

Table VI (C). Miss Distance, Sweep, Full Automatic, Standing (Continued) (U)

CONFIDENTIAL

		ROUND									
		1					2				
		FIRER RIFLE		AUGST		2		3		4	
1.0	381V	1	1.6	2	1.6	10.9	5.7	4.9	18.6	17.0	14.6
	H					5.4	18.7	44.0	57.6	63.6	13.0
382V	-	3.2	-	3.0	2.8	2.6	8.0	4.7	17.7	72.2	74.7
	H					2.2	2.5	40.5	18.0	4.3	0
383V	-	6.7	-	3.5	6.6	6.6	7.9	7.9	40.5	50.8	56.3
	H					6.6	7.9	7.9	3.9	2.8	55.9
384V	-	4.5	-	3.4	8.1	25.5	49.3	67.9	90.0	111.0	128.0
	H					6.2	6.2	7.4	2.2	9.9	0
385V	-	6.6	-	5.5	4.8	14.8	14.6	14.6	75.7	83.6	102.9
	H					5.2	5.2	5.2	5.3	127.0	143.6
		0		7.5	7.5	21.1	37.5	45.3	58.3	71.0	84.6
AVERAGE	V	1.3	-	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
STD DEV	V	3.1	3.6	7.7	4.1	2.5	9.3	5.5	7.4	5.7	2.2
11	5CIV	4.1	-	3.0	-	1.5	-	4.1	-	2.6	-
	H					2.5	13.3	27.4	34.5	37.1	41.0
5C2V	-	3	9.6	2.5	1.0	2.7	9.0	4.7	7.0	6.2	6.1
	H					1.2	1.0	8.9	10.3	20.1	37.5
5C3V	-	2.2	-	3.3	3.3	6.8	8.8	4.0	4.7	11.1	3.4
	H					10.5	19.5	24.2	31.5	41.0	56.6
5C4V	-	2.4	-	1.2	1.2	1.3	3.2	7	14.3	13.9	3.0
	H					6.2	7.1	10.6	34.5	50.4	58.7
5C5V	-	4.5	1.6	5.0	5.0	6.4	3.8	4.6	2	52.5	62.5
	H					13.7	31.8	43.8	52.5	74.3	94.1
AVERAGE	V	7	-	2.2	2.2	2	5	1.3	5.5	7.9	4.0
STD DEV	V	3.2	4.7	4.8	3.5	5.4	5.3	5.4	3.2	2.6	5.0

CONFIDENTIAL

Table VI (C). Miss Distance, Sweep, Full Automatic, Standing (Continued) (u)

CONFIDENTIAL

FIRER BURST		ROUND									
		1	2	3	4	5	6	7	8	9	10
1	436V	6.9	5.9	-17.2	3.8	5.3	-	.1	16.4	1.6	-
	H	-10.3	6.9	-	6.9	-4.7	-	2.7	-	1.1	-16.0
437V	5.5	-	5.2	-	5.6	-8.3	1.4	-	.4	2.4	6.0
	H	-	2.2	-	2.5	6.1	6.9	8.5	-8.5	2.2	10.2
438V	-2.5	-	1.5	-	3.3	-	4.0	2.5	-	1.9	15.1
	H	-	4.1	-	4.1	-	4.6	3.5	4.0	9.6	6.3
439V	2.6	-	8.7	-	1.3	4.9	-4.6	8.6	-	9.7	21.1
	H	-10.4	-	6.2	-	1.4	-1.1	1.2	1.2	14.4	14.4
440V	3.3	-	1.0	-	5.3	4.5	-2.4	2.9	-3.3	9.6	1.5
	H	-	7.5	-	3.0	-	1.7	-.9	-	1.4	4.6
AVERAGE V	3.2	-	2.0	-	6.6	4.4	-	3.3	-	1.4	6.3
STD DEV V	3.6	5.5	6.2	5.9	4.3	3.5	4.7	9.5	3.5	3.6	8.3
2	195V	-4.2	-	2.7	2.5	-	5.1	-9.9	-	2.3	-
	H	-7.1	-	4.6	-4.4	-	3.7	-2.5	1.9	-1.1	-
197V	-	6.7	-	7	5.9	-	3.7	-3.2	2.1	1.1	-
	H	-	6.6	-	6.3	-	6.0	-3.8	3.4	-	4.7
198V	7.4	-	4.3	-	2.8	8.4	-3.1	3.1	-	3.5	-
	H	-	7.3	-	5.8	-	5.8	-5.1	2.2	-1.9	-
199V	-	2.1	-	1.1	-	4.7	-8.5	-5.5	1.1	-	4.7
	H	-	4.9	-	4.3	-	3.8	-2.2	2.2	-	4.7
200V	-	6.6	-	6.6	-	6.5	-9.0	-2.3	11.8	-14.3	-
	H	-11.1	-	7.0	-	6.0	-3.0	-2.2	-2.1	1.6	-
AVERAGE V	4.4	-	3	-	1.0	-	1.7	-2.2	-3.8	-4.2	-
STD DEV V	11.0	6.0	4.3	8.2	5.0	4.9	5.8	3.4	5.7	4.0	7.1
3	316V	-14.4	-	4.3	-23.6	-	16.3	-18.0	-15.7	1.4	-
	H	-	7.6	-	5.9	-	5.0	-4.4	-3.2	3.1	-
317V	-6.5	-	3.1	-	4.2	9.3	-6.0	-	2.5	-8.6	-
	H	-	5.9	-	4.9	-	4.8	-3.8	-3.1	-2.5	-
318V	-	8	-	2.1	-	6.7	-8.8	-16.5	-	8.0	-
	H	-	5.6	-	3.9	-	3.0	-2.5	1.9	-	4.1
319V	3.5	-	1.5	-	9.2	-	2	4.5	-10.9	-4.2	-
	H	-	5.3	-	2.6	-	4	-4	-6.6	-1.1	-
320V	-	9.0	-	3.9	-	9	-6.2	12.8	7.6	-1.1	-
	H	-	11.7	-	7.7	-	7.6	-6.1	4.7	-3.3	-
AVERAGE V	5.1	-	1.7	-	4.3	-	2.0	-6.4	-4.4	-	3.6
STD DEV V	7.3	3.0	12.2	10.6	12.3	9.1	6.5	7.8	10.9	5.3	8.0

CONFIDENTIAL

Table VII (C). Miss Distance, Point, Controlled Burst, Standing (u)

CONFIDENTIAL

FIRER PUKST	1	2	3	4	5	6	7	8	9	10	11	12	ROUND
													1
4 236V	8.1	11.4	3.5	4.6	5.7	2.2	4.4	1.0	8.9	1.4	8.2		
H -	5.2	3.6	1.7	1.1	0.5	2.9	3.4	4.3	6.8	5.0	5.8		
237V	4.5	4.2	0.9	1.2	6.0	4.2	0.2	2.3	1.8	9.2	8.0	8.4	
H -	12.6	8.2	7.7	3.3	2.3	1.3	2.1	5.5	10.9	11.3	13.6		
238V	5.0	8.2	2.8	1.5	3.1	2.8	7.9	9.9	8.3	0.0	0.0		
H -	6.5	4.6	2.5	2.1	0.0	1.1	1.2	6.8	0.0	0.0	0.0		
239V	4.2	1.3	5.8	3.6	2.3	6.5	6.7	4.4	7.6	9.4	12.6	4.3	
H -	9.2	6.1	5.7	5.2	4.1	3.9	0.9	0.1	4.1	5.3	6.2		
240V	1.2	2.6	2.2	4.4	2.2	6.3	4.8	1.7	1.5	9.4	11.2	6.6	
H -	12.0	8.9	7.5	3.9	2.0	1.1	0.5	0.3	1.7	6.0	6.3	8.2	
AVERAGE V	1.4	7.6	1.4	3.0	3.7	2.8	4.4	2.7	9.2	8.3	6.3	6.4	
STD DEV V	5.5	3.0	1.6	1.6	5.0	3.2	4.9	0.2	5.0	2.2			
5 476V	1.2	4.4	2.5	4.2	5.5	7.5	6.2	5.7	9.7	0.0	0.0		
H -	8.0	4.0	2.3	0.7	1.2	1.2	1.6	2.0	4.8	0.0	0.0		
477V	7.3	15.2	31.9	22.3	3.2	3.0	13.6	4.9	15.8	5.1	29.1	9.6	
H -	12.8	10.4	5.3	4.4	4.0	1.6	1.5	0.1	0.6	1.9	2.9	3.7	
478V	19.1	8.6	25.7	27.7	9.2	31.0	8.9	22.9	13.3	24.9	8.8	20.0	
H -	2.1	0.9	3	4	1.1	2.4	2.5	2.6	4.5	5.2	8.7	13.1	
479V	7.9	25.7	27.0	9.9	12.1	8.4	20.3	17.5	19.2	0.9	5.0	1.8	
H -	15.2	13.4	10.9	10.0	8.6	9.3	6.8	2.5	4.4	5.7	7.2		
48CV	10.1	6.5	14.6	8.8	7.0	3.6	1.6	3.6	16.9	8.3	9.8	8.2	
H -	12.5	9.8	9.8	5.6	4.1	1.0	1.2	1.8	2.7	13.1	14.6	16.3	
AVERAGE V	8.9	11.1	20.3	16.6	9	10.7	9.5	3.9	7.3	9.8	13.2	4.4	
STD DEV V	6.1	9.7	11.8	12.5	8.9	11.6	8.2	16.3	15.1	10.5	10.8	5.4	
6 276V	3.3	2.1	3.1	5.5	4.9	3.1	5.3	6.5	3.8	6.6	2.3	3	
H -	11.0	8.5	7.2	2.3	1.5	1.4	0.2	0.7	4.8	1.3	1.5	8.7	
277V	4.9	13.6	4.9	11.5	9.6	8.0	10.9	3.0	0.0	10.0	4.6		
H -	7.4	6.6	6.1	4.9	4.6	3.6	2.0	1.1	1.1	1.5	1.7	3.1	
278V	14.6	13.2	14.3	5.8	6.6	6.2	7.0	10.4	9.5	8.5	6.3	9.1	
H -	3.5	6.3	8.3	5.8	4.2	3.5	3.5	2.3	2.3	2.3	1.3	1.1	
279V	3.8	4.5	2.0	1.9	1.5	8.5	2.3	7.3	9.5	2.7	8.2	7.8	
H -	7.7	6.5	3.4	1.7	1.1	0.2	1.2	2.2	3.3	4.0	4.1		
280V	1.8	14.3	3	17.1	15.1	11.7	17.2	2.2	9.9	14.1	14.0	11.6	
H -	5.5	4.3	3.5	2.1	1.4	0.5	0.7	2.1	2.6	3.5	9.2		
AVERAGE V	3.7	9.5	3.6	8.3	8.0	7.5	8.5	5.0	6.5	8.4	7.1	5.7	
STD DEV V	5.4	5.8	6.7	6.0	5.1	3.2	5.8	4.8	4.4	4.2	4.4	5.4	

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Table VII (C). Miss Distance, Point, Controlled Burst, Standing (Continued) (ii)

CONFIDENTIAL

FIRER BURST	7	ROUND											
		1	2	3	4	5	6	7	8	9	10	11	12
156V	-	2.1	-	4.1	-	1.0	-	4.1	-	10.9	-	11.8	-
5.2	-	2.8	-	2.7	-	2.3	-	.7	-.5	.8	-	8.2	-
157V	-	1.2	-	3.7	-	1.5	-	5.5	-	11.4	-	9.1	-
17.3	-	10.0	-	3.2	-	1.2	-	2.3	-	2.7	-	14.4	-
158V	-	7.6	-	10.5	-	14.4	-	17.6	-	14.2	-	8.8	-
11.0	-	10.3	-	8.0	-	7.0	-	7.1	-	5.8	-	4.9	-
12.3	-	6.1	-	4.0	-	8.8	-	9.7	-	2.5	-	5.7	-
18.0	-	16.6	-	14.9	-	14.6	-	6.3	-	1.6	-	1.0	-
20.7	-	19.5	-	14.0	-	5.9	-	9.6	-	.7	-	2.4	-
7.0	-	6.2	-	5.5	-	1.1	-	.4	-	1.2	-	1.6	-
AVERAGE V	-	9.8	-	6.4	-	5.4	-	8.4	-	5.3	-	7.6	-
STD DEV V	8.0	9.4	8.4	5.5	10.0	6.0	3.9	4.3	10.5	6.4	10.5	6.4	4.5
B	356V	4.1	12.6	4.6	6.5	-	1.1	-	4.4	8.4	4.7	2.0	-
H	-	5.3	3.8	3.6	3.6	-	2.4	-	2.0	1.1	.4	.2	-
357V	-	10.4	-	9.6	-	5.4	-	7.7	-	4.7	-	11.0	-
H	-	6.4	-	4.9	-	4.3	-	3.5	-	3.4	-	3.1	-
356V	-	12.5	-	9.2	-	11.1	-	18.5	-	10.0	-	14.0	-
H	-	5.8	-	5.4	-	5.3	-	4.2	-	1.2	-	1.5	-
359V	-	0.0	-	4.9	-	4.4	-	5.5	-	15.3	-	3.8	-
H	-	17.0	-	16.2	-	15.3	-	12.6	-	11.0	-	10.5	-
360V	-	4.2	-	1.5	-	1.8	-	1.1	-	4.4	-	2.6	-
H	-	4.6	-	4.4	-	2.1	-	.2	-	.2	-	.3	-
AVERAGE V	-	2.9	-	2.3	-	2.0	-	5.2	-	7.3	-	5.1	-
STD DEV V	3.0	7.1	6.3	7.2	5.5	5.5	5.1	5.2	6.9	6.9	6.8	6.8	7.5
9	116V	-	12.7	-	10.2	2.9	-	5.3	-	6.2	-	4.9	-
H	-	3.9	-	3.9	-	2.2	-	1.7	-	1.6	-	2.6	-
117V	-	5.6	-	6.6	-	4.5	-	10.5	-	5.8	-	11.0	-
H	-	5.9	-	5.3	-	4.9	-	4.3	-	3.2	-	2.0	-
118V	-	12.2	-	12.5	-	19.2	-	.4	-	2.7	-	6.0	-
H	-	2.8	-	2.2	-	1.0	-	1.4	-	2.1	-	4.4	-
119V	-	19.8	-	12.5	-	19.3	-	1.2	-	4.9	-	3.1	-
H	-	5.9	-	2.2	-	2.7	-	.7	-	.7	-	1.0	-
120V	-	6.3	-	8.5	-	12.8	-	14.6	-	9.8	-	14.1	-
H	-	9.8	-	3.0	-	2.5	-	1.3	-	1.3	-	1.5	-
AVERAGE V	-	11.2	-	10.1	-	10.6	-	5.9	-	6.6	-	4.3	-
STD DEV V	5.3	2.6	9.7	6.7	5.5	6.6	4.8	5.8	4.8	4.8	4.2	3.5	.0

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Table VII (C). Miss Distance, Point, Controlled Burst, Standing (Continued) (U)

CONFIDENTIAL

FIRER BURST	ROUND											
	1	2	3	4	5	6	7	8	9	10	11	12
10 396V	4.3	5.9	3.9	4.7	13.3	10.9	8.3	7.9	6.3	7.5	11.7	17.4
H -	5.7	4.0	3.8	2.4	1.0	6.8	9.1	9.8	16.0	19.4	24.6	33.9
397V	9.0	7	7	5.7	2.7	10.6	1.4	1.1	14.8	2.3	5.3	5.3
H -	5.9	5.7	5.1	4.0	2.0	1.2	1.2	6	0	6	1.2	3.6
398V	16.7	4.6	13.4	21.3	5.9	7.1	17.5	9.8	8.5	12.0	5.0	7.5
H -	5.1	2.4	1.9	1.9	1.1	1.1	2.5	2.5	3.7	7.1	9.5	9.8
399V	6.7	5.3	12.5	3.9	2.5	4.7	2.2	2.2	7.4	7.4	0	0
H -	11.5	9.7	8.1	1.6	1.6	1.6	2.1	2.3	5.9	15.7	0	0
400V	8	7.6	4.2	3.3	2.3	3.7	4.0	9.4	10.0	16.5	4.9	16.3
H -	4.7	3.3	0.8	0	0.3	0.4	1.2	4.7	6.2	6.2	9.9	9.9
AVERAGE V	2.2	4.8	5.4	5.6	5.3	7.4	5.2	3.3	5.0	9.1	3.1	11.6
STD DEV V	10.0	2.5	7.5	9.5	4.7	3.3	8.0	8.0	8.8	5.4	7.0	6.1
11 516V	4.4	10.9	3.9	5.1	7.5	5.7	6.8	2.9	7	5.2	9.1	9.8
H -	6.8	4.2	2.3	2.2	1.8	1.6	1.5	1.2	1.2	4.2	6.0	11.1
517V	2	7.8	7.0	4.5	2.7	1.6	1.5	1.2	3.0	3.4	2.2	1.2
H -	11.5	11.2	10.8	8.3	6.0	4.6	3.5	3.2	3.1	2.0	1.5	5.9
518V	2.2	3.2	5	8.9	6.7	2.1	2.0	1.6	6.7	5.6	4.6	20.0
H -	6.2	6.0	5.8	3.6	3.5	3.2	3.1	3.1	2.7	2.2	4	10.2
519V	9.3	7.6	10.4	6.0	7.7	4.5	2.2	8.0	2.7	10.7	5.4	4.7
H -	7.3	7.7	5.5	4.8	4.0	3.4	3.4	3.0	2.8	2.1	6	1.2
520V	2.5	7.4	5.9	6.4	6.4	2.5	8.9	1.6	4.4	3.1	1.8	2.6
H -	6.8	4.7	4.1	3.9	3.8	2.8	2.4	1.6	1.2	1.1	.2	1.5
AVERAGE V	3.4	7.4	5.3	6.2	6.2	3.0	2.8	2.7	4.2	4.6	6.6	6.6
STD DEV V	3.2	2.7	4.0	1.7	2.0	2.2	4.7	3.5	3.0	2.9	8.7	8.7

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Table VII (C). Miss Distance, Point, Controlled Burst, Standing (Continued) (U)

CONFIDENTIAL

FIRER BURST		ROUND											
		1	2	3	4	5	6	7	8	9	10	11	12
1	431V	1.3	6.7	5.4	2.0	1.6	1.3	6.1	4.8	3.4	8.2	13.7	14.1
	H	-	1.9	.8	.7	1.8	3.3	4.2	6.8	9.1	9.2	11.5	12.2
432V	-	2.8	4.6	8.0	15.4	13.7	-	21.2	7.0	5.9	8.2	10.1	12.6
H	-	2.9	2.9	3.4	5.2	5.2	6.3	6.9	7.5	8.3	8.7	10.7	11.8
433V	-	2.5	3.5	3.5	12.4	2.7	3.3	6.3	5.9	9.8	1.7	4	6.9
H	-	2.0	1.6	.6	4.7	4.5	5.0	5.9	6.8	8.6	8.7	9.1	9.1
434V	10.0	-	1.2	3.7	6.1	4.5	9.4	1.1	4.5	4.0	6.5	2.6	8.9
H	-	6.3	6.6	6.1	5.8	5.1	4.8	2.4	1.8	1.1	6.6	2.2	14.4
435V	-	8.9	4.7	2.9	9.9	4.5	19.0	13.5	8.5	1.5	9.6	18.3	4.5
H	-	1.8	2.3	5.0	5.4	6.9	8.4	9.5	9.6	11.4	18.8	23.4	
AVERAGE	V	-	1.1	.8	2.1	4.2	2.5	1.4	6.4	1.7	3.2	7.2	.8
STD DEV	V	6.9	5.7	5.1	10.5	7.2	15.0	5.2	6.5	6.0	6.5	8.3	10.6
2	191V	6.2	.0	.9	4.1	2.5	13.8	6.1	25.6	5.6	13.7	6.2	24.5
	H	-	7.3	6.6	4.1	3.9	3	3	2.2	2.7	3.3	4.8	7.7
192V	-	3.9	1.7	17.4	1.8	8.0	10.6	9.8	19.1	4.4	11.9	17.3	16.6
H	-	9.7	9.6	2.9	1.0	2.5	6.5	7.0	7.6	8.4	8.6	10.9	16.6
193V	-	9.2	4.5	4.3	12.0	13.1	5.2	10.6	4.0	10.5	7.8	3.9	6.2
H	-	4.0	3.1	5.6	1.3	.7	4.6	4.8	11.5	15.2	18.5	20.2	21.1
194V	-	2.2	5.6	1.3	.3	4.1	4.7	14.3	.9	2.1	.8	5.1	4.8
H	-	.5	5	.7	4.1	4.1	4.6	5.7	5.9	6.0	6.2	7.6	9.9
195V	-	4.6	5.9	2.9	2.2	5.3	6.9	11.2	19.2	.6	1.1	16.9	1.7
H	-	2.9	1.3	.1	.3	.5	1.2	1.3	2.1	2.7	3.1	5.9	6.8
AVERAGE	V	4.3	3.5	2.7	.7	5.8	6.4	4.7	13.4	4.4	6.3	9.9	7.6
STD DEV	V	4.2	2.6	8.6	6.4	5.1	7.0	10.8	11.3	4.1	6.9	6.6	12.7
3	311V	16.1	1.8	5.3	6.5	3.1	4.4	8.7	.7	10.1	7.2	4.2	6.3
	H	-	8.3	1.3	1.7	4.1	5.0	6.7	6.9	8.1	8.4	9.8	13.8
312V	-	11.3	3.0	9.5	2.7	10.1	8.4	2.5	3.1	14.8	-	1.0	3.6
H	-	3.8	.4	2.0	3.9	7.1	10.7	12.0	12.6	13.4	13.4	18.5	20.0
313V	-	11.3	3.6	7.1	4.5	2.7	12.5	4.3	1.6	5.3	6.3	20.5	14.2
H	-	7.1	1.0	.2	2.0	3.9	6.6	7.6	9.7	10.3	12.4	13.5	
314V	-	4.0	14.1	9.2	5.2	4.1	10.6	4.2	5.1	4.4	4.0	-	3.7
H	-	5.5	2.7	2.7	2.3	2.0	-	.6	1.4	1.6	1.9	3.5	4.3
315V	-	7.4	.1	.1	2.4	3.4	9	.1	8.6	3.9	3.9	3.5	1.9
H	-	2.5	2.0	1.1	.3	.5	.6	1.0	3.9	6.7	8.5	10.5	16.5
AVERAGE	V	1.0	2.6	.3	1.4	2.0	5.6	.5	.3	3.8	.9	3.9	3.4
STD DEV	V	12.2	6.9	7.9	4.8	5.7	7.2	5.4	5.3	8.8	5.1	10.2	7.3

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Table VIII (C). Miss Distance, Point, Full Automatic, Standing (U)

CONFIDENTIAL

		ROUND																											
		1			2			3			4			5			6			7			8			9			
4	231V	-	14.8	-	6.9	-	2.6	-	2.6	-	6.4	-	8.6	-	6.9	-	14.6	-	9.4	-	18.1	-	10	-	11	-	12		
	H	-	3.2	-	1.5	-	3.0	-	4.8	-	6.1	-	6.8	-	9.4	-	11.7	-	12.4	-	14.2	-	15.1	-	7.0	-	0.0		
232V	-	3.1	-	2.4	-	6.0	-	0.1	-	4.6	-	7.9	-	16.9	-	6.6	-	7.6	-	13.0	-	10.1	-	12.0	-		-		
H	-	4.3	-	12.2	-	16.1	-	1.2	-	2.2	-	7.9	-	10.5	-	12.9	-	13.1	-	14.0	-	17.4	-	16.4	-		-		
233V	-	10.7	-	6.3	-	1.6	-	1.6	-	6.2	-	10.8	-	6.2	-	13.3	-	10.4	-	10.9	-	1.2	-	14.0	-	14.6	-	24.8	
H	-	17.8	-	4.2	-	3.2	-	3.2	-	10.4	-	20.7	-	6.5	-	4.2	-	8.0	-	6.7	-	8.5	-	9.8	-	11.7	-		-
234V	-	8.3	-	3.3	-	3.2	-	4.5	-	4.4	-	10.3	-	0.3	-	0.1	-	1.9	-	2.5	-	3.1	-	5.2	-	8.3	-	14.9	-
H	-	2.9	-	6.2	-	0.6	-	4.5	-	1.3	-	5.9	-	0.8	-	12.6	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
235V	-	1.9	-	2.0	-	3.9	-	4.0	-	4.5	-	5.6	-	7.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
H	-																												
AVERAGE V	-	5.3	-	0.7	-	0.9	-	0.5	-	1.9	-	1.8	-	1.7	-	2.0	-	3.3	-	1.2	-	0.6	-	0.7	-	0.7	-	0.7	
STD DEV V	V	11.9	-	9.6	-	3.6	-	6.8	-	12.2	-	7.3	-	11.3	-	10.6	-	9.5	-	13.8	-	11.8	-	22.1	-		-		
5	471V	-	4.6	-	9.6	-	15.0	-	25.2	-	6.8	-	2.7	-	13.2	-	6.3	-	3.5	-	10.6	-	10.3	-	4.0	-		-	
H	-	8.2	-	7.8	-	7.3	-	4.2	-	2.4	-	1.0	-	0.7	-	1.5	-	2.3	-	3.8	-	10.4	-	15.6	-		-		
472V	-	1.9	-	9.8	-	21.2	-	3.1	-	4.3	-	9.7	-	4.7	-	1.7	-	4.2	-	3.7	-	14.2	-	33.7	-		-		
H	-	13.1	-	3.9	-	3.1	-	2.7	-	2.0	-	0.8	-	2.0	-	2.5	-	9.3	-	13.3	-	20.9	-	30.2	-		-		
473V	-	13.1	-	3.9	-	2.0	-	4.1	-	3.1	-	5.2	-	0.5	-	11.9	-	12.7	-	4.8	-	9.3	-	2.8	-		-		
H	-	8.9	-	6.8	-	0.7	-	2.1	-	2.1	-	2.9	-	3.3	-	10.0	-	10.9	-	11.8	-	21.1	-	23.9	-		-		
474V	-	2.6	-	2.0	-	12.6	-	1.5	-	2.7	-	6.5	-	1.2	-	4.4	-	9.1	-	6.9	-	0.9	-	14.7	-		-		
H	-	5.6	-	0.7	-	1.7	-	1.9	-	1.9	-	3.0	-	3.3	-	5.7	-	8.9	-	9.6	-	14.3	-	16.9	-		-		
475V	-	4.5	-	6.3	-	4.9	-	1.7	-	11.4	-	1.2	-	25.0	-	2.2	-	15.9	-	3.5	-	9.4	-	13.1	-		-		
H	-	2.9	-	2.1	-	4.7	-	5.6	-	5.8	-	6.5	-	6.8	-	6.8	-	7.5	-	10.5	-	11.3	-	14.3	-		-		
AVERAGE V	-	1.7	-	2.8	-	0.1	-	6.8	-	3.8	-	3.0	-	1.5	-	2.8	-	7.4	-	1.2	-	2.8	-	7.7	-		-		
STD DEV V	V	7.2	-	6.7	-	14.7	-	11.1	-	12.3	-	5.6	-	14.2	-	6.5	-	7.9	-	7.1	-	10.6	-	5.7	-		-		
6	271V	-	4.1	-	19.6	-	5.0	-	1.3	-	15.2	-	1.9	-	2.1	-	1.8	-	2.1	-	3.3	-	3.7	-	2.6	-		-	
H	-	6.4	-	6.0	-	4.4	-	3.2	-	3.0	-	2.8	-	2.1	-	3.2	-	7.2	-	8.5	-	11.1	-	11.7	-		-		
272V	-	4.6	-	10.3	-	9.6	-	2.4	-	7.4	-	7.9	-	7.0	-	3.6	-	3.2	-	6.6	-	4.7	-	4.6	-		-		
H	-	1.9	-	1.4	-	2.1	-	7.4	-	6.1	-	10.0	-	12.6	-	14.2	-	13.3	-	14.0	-	17.2	-	19.7	-		-		
273V	-	5.7	-	11.2	-	7.7	-	10.1	-	9.5	-	3.9	-	0	-	8.5	-	1.1	-	7.5	-	0	-	0	-	0	-	0	-
H	-	0.5	-	1.4	-	4.8	-	6.8	-	9.9	-	11.9	-	12.5	-	19.4	-	23.3	-	24.8	-	0.0	-		-		-		-
274V	-	4.2	-	3.5	-	5.7	-	4.9	-	14.2	-	3	-	11.0	-	0.5	-	1.4	-	17.7	-	7.5	-	2.4	-		-		
H	-	1.2	-	4.3	-	5.0	-	5.4	-	5.6	-	5.6	-	6.8	-	7.8	-	9.0	-	10.1	-	10.2	-	10.6	-		-		
275V	-	9.9	-	1.7	-	4.6	-	2.9	-	5.3	-	1.2	-	2.0	-	4.8	-	0.9	-	7.0	-	1.1	-	4.6	-		-		
H	-	4.7	-	1.3	-	3.9	-	5.5	-	8.8	-	12.0	-	14.7	-	15.6	-	16.5	-	17.2	-	17.8	-	16.1	-		-		
AVERAGE V	-	5.7	-	4.0	-	5.5	-	4.3	-	1.3	-	3	-	0.8	-	0.2	-	0.7	-	5.8	-	1.2	-	1.2	-		-		
STD DEV V	V	2.4	-	12.5	-	5.7	-	3.5	-	12.2	-	4.5	-	6.6	-	5.3	-	1.7	-	8.7	-	5.0	-	4.0	-		-		

Table VIII (C). Miss Distance, Point, Full Automatic, Standing (Continued) (U)

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FIRER BURST	1	2	3	4	5	6	7	8	9	10	11	12	ROUND		
													1.2		
1	431V	1.3	6.7	5.4	2.5	1.6	1.3	6.1	4.8	3.4	8.2	13.7	14.1	1.2	
	H	1.9	-	0.8	0.7	1.3	4.2	6.5	9.1	9.2	11.5	12.2	12.6	1.2	
2	432V	2.8	4.6	8.0	15.7	-	21.2	7.0	-	8.2	8.7	10.7	10.1	1.2	
	H	2.2	2.9	3.4	5.2	5.2	6.3	6.9	7.5	8.3	8.7	10.7	11.8	1.2	
3	433V	2.5	-	3.5	3.5	-	12.4	2.7	3.3	6.3	5.9	9.8	1.7	-	
	H	2.0	1.6	1.6	1.6	2.7	4.8	5.0	5.9	6.8	8.6	8.7	6.9	-	
4	434V	10.0	-	1.2	3.7	6.1	6.1	9.4	-	1.4	4.5	4.0	6.5	2.6	
	H	8.3	6.6	6.1	5.8	5.1	4.8	2.4	-	1.8	1.1	-	6.6	-	
5	435V	8.9	4.7	2.9	9.9	4.5	19.0	13.5	8.5	1.5	9.6	16.3	16.5	14.4	
	H	1.8	2.3	5.0	5.4	6.9	8.4	9.5	9.6	11.4	13.0	18.8	23.4	14.4	
6	AVERAGE	1.1	0.3	2.1	4.2	-	2.5	-	1.4	6.4	1.7	3.2	2.6	7.2	
	STD DEV	V	6.9	5.7	5.1	10.5	7.2	15.0	5.2	6.5	6.0	6.5	8.3	10.6	7.2
7	191V	6.2	0	0	9	-	4.1	2.5	13.8	6.1	25.6	5.6	13.7	6.2	
	H	7.3	-	6.6	4.1	-	3.9	-	3	3	2.2	2.7	3.3	7.7	
8	192V	3.9	1.7	17.4	-	1.8	8.0	10.6	9.8	19.1	4.4	11.9	17.3	16.6	
	H	9.7	-	9.6	2.9	1.0	2.5	6.5	7.0	7.6	8.4	8.6	10.9	16.6	
9	193V	3.2	4.5	4.3	12.0	13.1	5.2	10.6	4.0	10.5	15.7	7.8	3.9	-	
	H	4.0	-	3.1	1.7	0.7	4.6	4.8	11.5	15.2	15.7	18.5	20.2	-	
10	194V	2.2	5.6	5.6	1.3	-	3	-	4.1	14.3	-	2.1	-	5.1	
	H	0.5	-	0.7	1.1	-	4.1	4.6	5.7	5.9	6.0	6.2	7.6	4.8	
11	195V	4.6	5.9	2.9	-	2.2	5.3	6.9	11.2	19.2	-	1.1	16.9	-	
	H	2.9	-	1.3	0.1	0.3	0.5	1.2	1.3	2.1	2.7	3.1	5.9	6.6	
12	AVERAGE	4.3	3.5	2.7	0.7	-	5.8	6.4	4.7	13.4	4.4	6.3	9.9	7.6	
	STD DEV	V	4.2	2.6	8.6	6.4	5.1	7.0	10.8	11.3	4.1	6.9	6.6	12.7	7.6
13	311V	16.1	-	1.8	-	5.3	6.5	-	3.1	4.4	8.7	10.1	7.2	-	
	H	8.3	-	1.3	1.7	4.1	5.0	6.7	6.9	8.1	8.4	9.8	10.9	6.3	-
14	312V	11.9	-	3.0	-	9.5	2.7	10.1	8.4	2.5	3.1	14.8	1.0	6.7	
	H	3.8	-	0.4	2.0	3.9	7.1	10.7	12.0	12.6	13.4	18.5	20.0	-	
15	313V	11.3	-	3.8	7.1	-	4.5	2.7	12.5	4.3	1.5	5.3	6.3	20.5	-
	H	7.1	-	1.0	0.2	2.0	0.0	3.9	6.6	7.6	9.7	10.3	12.4	13.5	-
16	314V	4.0	14.1	9.2	5.2	4.1	10.6	-	4.2	5.1	4.4	4.4	0	-	
	H	5.5	2.7	2.7	-	2.3	-	2.0	-	0.4	1.4	1.6	3.5	4.3	-
17	315V	7.4	-	0.1	1	2.4	-	3.4	0.9	-	8.6	3.9	3.5	1.9	
	H	2.5	-	2.0	1.1	0.3	0.5	0.6	1.0	3.9	6.7	8.5	10.5	16.5	-
18	AVERAGE	1.0	2.6	0.3	1.4	-	2.0	5.6	5.5	-	3.8	9	3.9	3.4	
	STD DEV	V	12.2	6.9	7.9	4.8	5.7	7.2	5.4	5.3	8.8	5.1	10.2	7.3	3.4

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Table VIII (C). Miss Distance, Point, Full Automatic, Standing (U)

CONFIDENTIAL

FIREX BURST		ROUND											
		1	2	3	4	5	6	7	8	9	10	11	12
4	231V	14.9	-	6.9	2.6	2.6	6.4	-	8.6	6.9	-	9.4	18.1
	3.2	1.5	3.0	4.8	6.1	6.1	6.8	-	9.4	11.7	-	12.4	14.2
	232V	-	3.1	-	2.4	6.0	4.6	7.9	-	16.9	-	6.6	-
	233H	-	6.3	-	1.9	1.2	2.2	7.9	10.5	12.9	13.1	14.0	17.4
	12.7	1.6	1.1	-	1.6	6.2	10.8	4.2	13.3	-	10.9	-	12.0
	234V	-	1.7	-	6.3	-	1.6	1.4	3.5	4.2	6.0	6.7	8.5
	17.8	-	4.2	-	3.2	-	10.9	-	20.7	6.5	-	8.1	14.7
	235Y	-	8.3	-	3.3	-	3.2	-	4.4	1.1	-	7.2	-
	2.9	-	6.2	-	6.6	-	4.5	-	1.3	5.9	-	1.9	5.2
	H	-	1.9	-	1.5	2.0	3.9	4.0	4.5	5.6	7.0	-	0.0
	AVERAGE V	-	5.3	-	7	9	5	-	1.9	1.8	-	2.6	-
	STD DEV V	11.9	-	9.6	3.6	6.8	12.2	7.3	11.3	10.6	9.5	13.8	22.1
5	471V	4.6	-	15.0	25.2	6.8	2.7	13.2	6.3	-	3.5	10.6	4.0
	H	-	8.2	-	7.8	-	4.2	-	1.0	-	1.5	2.3	10.4
	472V	-	1.9	-	9.8	21.2	3.1	4.3	9.7	4.7	-	4.2	14.2
	473H	-	13.1	-	3.9	-	3.1	-	2.0	2.0	-	9.3	13.3
	473V	-	13.1	-	3.9	-	2.0	-	4.1	3.1	-	12.7	20.9
	H	-	8.9	-	6.8	-	7	2.1	2.1	2.9	-	4.8	9.3
	474V	-	2.6	-	2.0	-	12.6	-	1.5	21.7	6.5	-	12.7
	H	-	5.6	-	7	1.7	1.9	-	1.9	3.0	3.3	-	10.0
	475V	-	4.5	-	6.3	-	4.9	-	1.7	11.4	1.2	-	25.0
	H	-	2.9	-	2.1	4.7	5.6	5.8	6.5	6.8	6.8	-	10.5
	AVERAGE V	-	1.7	-	2.8	1	5.8	-	3.8	3.0	-	1.4	-
	STD DEV V	7.2	-	6.9	14.7	11.1	12.3	5.6	14.2	6.5	7.9	-	5.7
6	271V	-	4.1	19.6	5.0	-	1.3	15.2	-	1.9	2.1	-	1.2
	H	-	6.4	-	6.0	-	4.4	3.2	-	2.8	2.1	-	3.3
	272V	-	4.6	-	10.3	-	9.6	-	2.4	7.4	7.9	-	3.2
	273H	-	1.9	-	1.4	-	2.1	7.4	8.1	10.0	12.6	13.3	14.2
	273V	-	5.7	-	11.2	-	7.7	-	10.1	9.5	-	8.5	11.1
	H	-	5	-	1.4	-	4.8	6.8	9.9	11.9	12.5	19.4	23.3
	274V	-	4.2	-	3.5	-	5.7	-	4.9	1.3	11.0	1.5	17.7
	H	-	1.1	-	3.7	-	4.3	-	5.4	5.6	6.8	7.8	10.1
	275V	-	9.9	-	1.7	-	6.6	-	2.9	5.3	-	4.8	14.6
	H	-	4.7	-	1.3	-	3.9	2.5	8.8	12.0	14.7	15.6	16.5
	AVERAGE V	-	5.7	-	0.0	-	4.5	-	1.3	3	-	0.8	-
	STD DEV V	2.4	-	12.5	5.7	3.5	12.2	4.5	6.0	5.3	1.7	8.7	4.0

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Table VIII (C). Miss Distance, Point, Full Automatic, Standing (Continued) (U)

CONFIDENTIAL

		ROUND									
		1					2				
FIRER BURST		1	2	3	4	5	6	7	8	9	10
7	151V	21.7	8.1	27.6	5.3	4.0	1.3	11.2	.4	3.2	1.5
	H	16.5	10.5	4.5	3.3	1.8	.8	1.5	3.7	8.1	8.7
	152V	7.3	6.5	1.5	11.3	.4	3.0	3.2	13.9	5.0	14.2
	H	5.5	2.9	1.3	.5	.3	.1	1.6	2.3	4.8	1.1
	153V	1.9	11.7	11.7	6.5	2.1	2.3	7.2	4.8	9.0	17.8
	H	.2	1.4	4.3	4.3	5.8	5.9	7.1	9.1	9.7	12.7
	154V	8.9	8.7	5.5	3.7	4.5	7.4	10.0	13.8	16.5	13.4
	H	18.2	15.1	14.7	14.4	13.4	12.2	11.8	11.7	10.8	2.9
	155V	4.1	3.2	1.2	7.4	5.2	3.5	5.3	3.2	4.7	3.2
	H	.1	.5	.9	3.0	3.3	6.0	6.1	6.8	6.5	11.1
	AVERAGE	V	3.5	3.8	9.5	2.4	2.2	0	5.4	5.7	3.6
	STD DEV	V	11.0	8.1	11.0	7.7	3.3	4.5	4.2	5.7	5.9
8	351V	2.7	.2	1.6	.5	23.7	20.3	4.8	9.4	1.2	3.1
	H	3.9	3.8	4.1	5.4	7.0	7.2	7.3	7.6	9.1	11.1
	352V	3.0	3.0	13.7	23.2	5.3	24.9	6.8	0	0	16.3
	H	5.6	3.5	6.3	8.8	9.3	14.8	17.1	0	0	4.0
	353V	11.1	6.1	3.7	3.4	3.3	3.3	4.0	3.3	7.2	18.1
	H	.5	5.3	5.4	11.2	5.0	15.7	5.0	6.5	7.6	2.6
	354V	3.0	4.8	6.1	7.3	9.8	10.7	12.4	0	0	11.2
	H	6.5	11.7	11.4	4.8	5.0	5.9	10.6	0	0	0
	355V	12.4	19.8	23.6	8.0	1.2	2.3	5.4	3	7.3	8.4
	H	5.1	1.1	.5	.3	.5	3.7	4.4	5.4	6.1	7.3
	AVERAGE	V	6.8	3.6	6.7	7.1	4.2	3.3	1.0	1.9	7.8
	STD DEV	V	4.6	10.0	12.0	10.2	12.3	16.7	8.1	6.6	10.6
9	111V	5.7	3.1	4.0	2.8	3.6	8.8	2	4.4	15.6	11.5
	H	6.3	4.2	4.6	4.4	3.2	3.5	5.6	6.4	9.3	13.3
	112V	10.2	13.5	12.8	8.9	3.2	3.1	6	3.6	8.7	16.4
	H	21.1	13.7	11.4	11.0	11.0	11.0	11.0	11.0	11.0	17.0
	113V	3.0	2.3	15.4	14.6	1.1	4.8	7.7	2.8	6.6	9.3
	H	7	9.2	10.5	11.2	12.9	15.3	16.7	18.5	23.0	27.2
	114V	9.1	4.8	.1	1.5	7.6	3.0	1.7	10.5	19.9	13.6
	H	9.3	6.5	4.6	4.0	1.3	3.6	9.9	12.1	14.3	9.5
	115V	1.1	2.7	8.0	2.7	1.1	3.4	8.0	21.5	10.9	15.8
	H	1.5	4.7	6.0	10.2	12.6	12.8	13.0	15.9	20.3	3.0
	AVERAGE	V	1.0	3.4	2.9	1.5	3.1	3.4	8.2	11.8	9.3
	STD DEV	V	7.5	6.6	10.4	8.6	2.9	4.2	5.6	9.2	10.6

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Table VIII (c). Miss Distance, Point, Full Automatic, Standing (Continued) (U)

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FIRER BURST	10	391V	1.4	2	1	4	2	5	6	7	8	9	10	11	12	ROUND		
																1.2	1.6	
392V	H	14.7	9.4	-	6.2	4.2	5.6	5.2	-	3.9	-	3.6	-	3.0	-	3.0	0	
H	7.2	-	4.8	-	11.2	4.2	11.2	3.6	-	4.1	-	6.2	-	5.4	-	1.9	0	
H	14.1	-	10.9	-	9.4	8.9	7.2	5.5	-	5.1	-	3.9	-	11.7	-	10.5	11.8	
393V	.6	-	12.5	-	14.4	9.5	12.3	9.9	-	6.3	1.2	10.5	-	1.3	-	12.4	17.5	
H	4.0	-	2.0	-	1.5	1.1	2.6	2.6	-	2.8	3.3	5.0	-	5.6	-	1.1	12.6	
394V	H	1.7	1.4	-	6.7	10.1	4.7	6.3	-	7.7	-	13.0	-	9.5	-	10.8	1.6	
H	12.0	-	10.5	-	8.5	4.7	3.6	3.3	-	3.0	2.6	3.6	-	5.1	-	8.5	9.8	
395V	H	8.3	7.6	-	3.7	7.7	9.4	5.5	-	2.2	-	1.2	-	6.9	-	4.7	1.2	
H	14.2	-	8.6	-	7.3	5.5	5.4	4.7	-	1.6	1.8	2.0	-	7.8	-	11.9	26.1	
AVERAGE	V	-	5	-	4.8	-	4.8	-	3.7	-	3.7	-	5.9	-	4.3	-	4.2	-
STD DEV	V	5.5	6.0	6.4	11.3	7.2	5.3	5.4	5.6	8.8	8.8	6.9	7.0	7.2	7.0	7.2	7.2	
11	511V	13.7	7.6	-	1.5	10.2	10.5	2.2	-	7.9	-	2.1	-	2.3	9.0	-	1.3	-
H	4.7	-	4.3	-	3.9	3.5	2.6	2.2	-	1.1	-	1.1	-	3.3	-	1.6	3.0	
512V	3.9	6.4	-	5	2.9	10.1	12.4	12.4	-	8.2	1.2	9.7	-	1.1	-	7.2	-	
H	10.2	-	10.0	-	9.5	6.7	6.7	5.2	-	3.1	6	1.4	-	2.7	3.0	2.7	3.0	
513V	5.2	1.7	-	1	1.0	1.0	0.9	0.8	-	4.1	0	0	-	0	-	0	0	
H	7.1	-	2.2	-	1.2	1.3	2.5	3.1	-	3.6	4.6	0	-	0	-	0	0	
514V	H	9.8	3.6	-	9.5	4.7	6.9	12.4	-	11.4	-	1.2	-	4.8	-	21.4	-	
H	12.8	-	7.0	-	4.8	4.5	3.5	1.8	-	1.0	-	4.7	1.2	1.4	-	2.8	6.2	
515V	H	1.9	2.4	-	3.3	3	5.0	2.6	-	17.8	-	4.8	0	0	0	0	0	
H	2.4	-	2.1	-	1.1	1.1	1.8	2.8	-	3.4	0	0	-	0	-	0	0	
AVERAGE	V	4.4	1.8	-	2.4	3.3	4.7	6.1	-	9.1	-	5.6	3.2	9.9	-	14.2	-	
STD DEV	V	7.4	5.1	4.3	4.5	6.6	5.8	6.3	3.4	3.8	5.0	10.3	14.3					

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Table VIII (C). Miss Distance, Point, Full Automatic, Standing (Continued) (u)

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FIRER	BURST	AV V	SIG V	S V	AV A V	VRMS	AV H	SIG H	S H
1	1	3.9	2.0	3.9	4.4	4.7	1.2	3.2	
	2	2.6	4.8	3.1	4.0	10.1	2.5	1.0	
	3	8.0	7.6	8.0	6.0	-	1.4	1.2	
	4	2.4	9.5	6.2	6.2	8.1	-	1.2	
	5	5.9	2.9	5.9	6.4	-	3.3	4.5	
SUMMARY		4.6	6.1	2.4	5.4	7.1	-	1.8	1.1
2	1	2.0	4.7	3.5	4.4	-	2.3	3.5	
	2	0.4	2.8	1.9	2.3	-	3.5	4.0	
	3	0.7	2.2	1.5	1.9	-	3.3	2.7	
	4	-	0.5	2.0	1.3	1.7	-	3.4	2.6
	5	1.0	1.9	1.1	1.8	-	2.3	3.3	
SUMMARY		0.7	2.9	0.9	1.9	2.6	-	3.0	0.6
3	1	-	1	2.8	2.0	2.0	-	1.0	1.3
	2	5.2	3.9	5.2	6.1	-	1	2.1	
	3	1.6	5.1	3.4	4.5	-	1.0	0.3	
	4	0.5	3.7	2.7	3.0	-	5.5	0.9	
	5	2.6	2.5	2.6	3.3	-	3.1	2.9	
SUMMARY		1.9	3.8	2.1	3.2	4.2	-	2.2	2.2
4	1	-	4.1	2.0	4.1	4.4	-	3	1.2
	2	-	2.9	2.9	2.8	2.9	-	2.3	1.4
	3	-	5.8	1.3	5.8	5.9	-	0.4	2.0
	4	-	2.1	1.3	2.1	2.4	-	0.8	1.5
	5	-	3.9	1.1	3.9	4.0	-	2.7	1.2
SUMMARY		-	2.7	1.3	1.4	3.7	4.1	-	1.5
5	1	-	3.3	3.0	3.3	4.0	-	3.7	1.3
	2	-	3.7	2.1	3.7	4.0	-	1.5	1.3
	3	1.4	2.4	1.8	2.4	-	2.8	2.5	
	4	-	1.1	4.2	3.0	3.6	-	0.9	1.6
	5	-	0.9	2.3	1.5	2.1	-	0.8	2.2
SUMMARY		-	1.1	2.9	2.4	3.3	-	1.6	1.7
6	1	-	6.1	3.2	6.1	6.6	-	1.9	2.2
	2	-	3.6	3.2	3.6	4.4	-	0.7	4.0
	3	-	1.9	2.7	3.9	4.4	-	2.5	2.1
	4	-	1.0	2.4	2.0	2.2	-	1.6	3.3
	5	-	3.5	4.2	4.2	4.9	-	2.5	2.5
SUMMARY		-	3.6	1.8	3.9	4.7	-	1.4	2.9

Table IX (C). Measures of Dispersion, Calibration, Standing (u)

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FIRER	BURST	AV V	SIG V	S V	AV AR V	VRMS	AV H	SIG H	S H
7	1	6.2	4.7	5.0	5.6	5.6	3	1.4	1.4
	2	3.2	3.7	3.2	4.4	4.4	1.0	1.0	1.4
3		5.0	5.0	3.3	4.5	4.5	1.0	2.6	2.6
4	2.9	4.4	4.4	3.2	4.6	4.6	.5	2.0	2.0
5	2.9	4.9	4.9	3.0	5.0	5.0	.9	.4	.4
SUMMARY		3.0	4.6	.8	3.5	4.8	1	.6	.6
8	1	-	4.7	1.8	4.7	4.9	1.3	2.0	2.0
	2	-	1.9	2.6	2.0	2.8	2.5	1.3	1.3
3	-	3.7	1.7	3.7	3.7	3.9	2.3	1.3	1.3
4	-	2.1	2.8	2.4	3.1	6.1	4.2	1.9	1.9
5	-	5.4	2.0	5.4	5.6	6.9	1.9		
SUMMARY	-	3.5	2.2	1.6	3.6	4.2	-	2.4	2.0
9	1	-	1.8	2.6	1.9	2.3	.2	1.9	1.5
	2	-	2.6	2.3	2.6	3.2	2.1	1.5	1.5
3	-	6.2	2.9	6.2	6.6	6.6	2.4	2.4	2.4
4		-	2.0	2.7	2.0	2.2	.4	2.4	2.4
5	-	.6	2.8	1.9	2.3	2.3	1.1	1.9	1.9
SUMMARY	-	2.0	2.7	2.5	2.9	3.7	-	1.8	1.7
10	1	-	2.0	5.1	6.6	4.6	2.2	2.2	2.2
	2	-	5.1	2.7	5.1	5.5	2.3	.6	.6
3	-	.1	3.0	2.2	2.2	2.4	2.5	1.0	1.0
4	-	3.3	2.9	3.3	4.0	4.0	1.6	3.4	3.4
5	-	.7	3.0	2.3	2.5	2.5	2.5	2.2	2.2
SUMMARY	1.1	-	3.4	2.9	3.5	4.0	-	2.1	2.5
11	1	-	2.0	2.5	1.8	1.8	2.5	.7	.7
	2	-	2.0	1.2	2.0	2.2	1.0	1.8	1.8
3	-	2.6	1.1	2.6	2.7	2.7	.4	1.5	1.5
4	-	2.1	.9	2.1	2.3	2.3	.7	2.5	2.5
5	-	2.5	2.1	2.5	2.1	2.1	1.4	1.3	1.3
SUMMARY	-	1.8	1.6	1.1	2.2	2.5	.3	1.6	1.5

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Table IX (C). Measures of Dispersion, Calibration, Standing (Continued) (U)

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FIRER	BURST	AV V	SIG V	S V	AV AR V	VRMS
1	426	4.3	5.9	5.2	7.1	
	427	5.4	6.2	6.5	8.0	
	428	3.1	5.5	6.2	6.1	
	429	1.1	4.5	3.5	4.4	
	430	1.3	5.0	3.9	4.9	
SUMMARY		3.1	5.5	4.7	6.3	
2	186	- 4.6	2.7	4.6	5.3	
	187	- 1.3	3.4	2.5	3.5	
	188	- 3.7	4.1	4.5	5.4	
	189	- 4.2	3.8	4.4	5.5	
	190	- 7	3.2	2.8	3.2	
SUMMARY		- 2.6	3.5	3.8	4.7	
3	306	- 1.2	2.2	1.9	2.6	
	307	- 1.1	7.4	5.3	7.0	
	308	- 1.4	7.3	5.0	7.2	
	309	- 2.2	6.7	5.9	6.8	
	310	- 4	6.2	5.0	6.0	
SUMMARY		- 6	6.3	4.6	6.1	
4	226	1.1	4.3	3.3	4.2	
	227	- 8.8	4.4	8.8	9.8	
	228	- 10.9	5.9	11.0	12.3	
	229	- 9.9	5.7	9.9	11.3	
	230	- 9.6	3.1	9.6	10.0	
SUMMARY		- 7.6	4.8	4.9	9.9	
5	466	- 7.6	3.5	7.6	8.3	
	467	- 8.7	6.0	8.8	10.5	
	468	- 12.4	4.3	12.4	13.1	
	469	- 12.4	8.9	12.7	15.1	
	470	- 12.7	7.5	12.7	14.6	
SUMMARY		- 10.8	6.4	10.8	12.6	
6	266	- 9	3.7	2.9	3.6	
	267	- 7	5.7	4.7	5.5	
	268	- 4.0	4.7	5.1	6.1	
	269	- 9.3	4.4	8.3	9.3	
	270	- 2.8	8.0	6.9	8.1	
SUMMARY		- 3.1	5.5	3.4	5.6	6.9

Table X (C). Measures of Dispersion, Sweep, Controlled Burst, Standing (U)

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FIRER	BURST	AV V	SIG V	S V	AV	AB	V	VRMS
7	146	- 4.5	7.1		6.2		8.1	
	147	- .4	4.9		4.2		4.7	
148	- 10.0	5.0		10.0		11.1		
149	- 2.9	9.3		8.2		9.4		
150	- .6	2.6		2.3		2.5		
SUMMARY	- 3.4	6.3	4.02	6.2	8.0			
8	346	- 6.5	4.0		6.7		7.6	
	347	- 2.0	11.0		9.5		10.8	
348	- 6.7	5.2		6.7		8.4		
349	- 9.3	5.8		8.4		10.0		
350	- 9.3	12.5		9.5		14.5		
SUMMARY	- 6.4	8.6	2.06	8.1	10.6			
9	106	- 1.0	3.0		2.6		3.0	
	107	3.6	5.8		5.5		6.6	
108	- 7.4	4.2		7.4		9.4		
109	- 7.4	7.4		9.4		11.7		
110	- 1.2	5.7		4.2		5.6		
SUMMARY	- 2.6	5.4	3.06	5.8	7.5			
10	386	.7	6.7		5.2		6.4	
	387	5.2	9.2		7.8		10.1	
388	- 2.9	2.9		3.3		4.0		
389	- 1.9	3.6		2.6		3.9		
390	- 5.3	18.6		15.4		18.6		
SUMMARY	1.3	10.4	3.09	6.9	10.6			
11	506	1.5	4.6		4.0		4.7	
	507	4.3	4.7		5.3		6.2	
508	- 5.4	3.8		5.4		6.5		
509	- 5.0	5.3		5.3		7.2		
510	- 6.8	5.2		7.0		8.4		
SUMMARY	- 4.0	4.8	3.02	5.4	6.7			

Table X (C). Measures of Dispersion, Sweep, Controlled Burst, Standing (Continued) (v)

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FIRER	BURST	AV V	SIG V	S V	AV AB V	VRMS
1	421	- 3.2	7.2	6.4	7.5	
	422	- 4.3	5.6	5.8	6.9	
	423	1.5	6.1	4.8	6.0	
	424	.1	7.2	5.9	6.9	
	425	- 6.2	7.8	7.6	9.7	
SUMMARY	- .7	6.8	4.1	6.1	7.5	
2	181	- 7.7	13.4	12.4	14.8	
	182	- 11.7	5.3	12.0	12.8	
	183	3.5	6.7	6.0	7.3	
	184	5.6	9.9	8.7	11.0	
	185	5.6	9.0	7.2	10.3	
SUMMARY	3.7	9.0	7.1	9.3	11.3	
3	301	6.2	7.4	7.7	9.3	
	302	4.0	7.1	6.7	7.9	
	303	- 3.9	4.4	4.6	5.7	
	304	- 4.0	7.6	6.9	8.3	
	305	- 1.4	5.9	4.3	5.9	
SUMMARY	1.8	6.6	4.3	6.0	7.4	
4	221	- 12.9	5.1	12.9	13.7	
	222	- .3	7.3	5.9	6.7	
	223	- 1.7	4.3	3.9	4.3	
	224	1.0	8.1	6.8	8.2	
	225	- 3.7	8.5	7.5	8.7	
SUMMARY	- 3.1	7.1	6.0	7.4	8.6	
5	461	- 12.3	12.5	13.0	17.1	
	462	- 12.4	10.0	12.8	15.7	
	463	- 7.6	5.7	7.6	9.3	
	464	- 7.0	10.4	8.8	12.1	
	465	- 12.0	15.6	14.0	19.2	
SUMMARY	- 10.3	11.3	2.7	11.2	15.0	
6	261	10.5	14.7	15.1	17.3	
	262	- 2.1	15.4	13.3	14.5	
	263	- 7.2	13.3	8.6	12.2	
	264	- 7.0	8.2	6.6	7.8	
	265	2.9	4.4	4.2	5.1	
SUMMARY	.9	10.6	6.5	9.6	11.5	

Table XI (C). Measures of Dispersion, Sweep, Full Automatic, Standing (u)

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FIRER	BURST	AV V	SIG V	SV	AV AR V	V RMS
7	141	9.4	7.1	9.1	10.8	
	142	- 3.6	8.0	7.1	8.5	
	143	- 10.9	4.5	10.9	11.7	
	144	- 5.9	6.2	7.2	8.3	
	145	- 2.4	6.5	5.0	5.6	
SUMMARY	- 2.9	6.5	7.1	7.8	9.4	
8	341	6.2	8.1	8.6	9.7	
	342	- 13.6	8.9	13.7	16.0	
	343	- 2.2	5.8	8.2	9.9	
	344	- 7.1	7.2	7.3	9.9	
	345	- 9.9	7.0	10.4	11.8	
SUMMARY	- 6.5	7.4	7.5	9.6	11.8	
9	101	- 1.4	6.9	5.5	6.7	
	102	- 5.5	9.8	9.2	10.8	
	103	- 11.3	8.9	12.6	14.2	
	104	- 1.7	5.4	3.9	5.4	
	105	- 3.6	5.9	6.0	6.7	
SUMMARY	1.3	7.5	6.5	7.4	9.3	
10	381	9.5	7.1	9.9	11.6	
	382	5.0	6.6	5.5	8.1	
	383	-	3.7	2.5	3.5	
	384	-	5.7	4.8	5.4	
	385	-	4.4	3.9	4.3	
SUMMARY	-	5.7	4.3	5.3	7.2	
11	501	- 4.9	2.7	4.9	5.5	
	502	- 2.5	7.0	6.2	7.2	
	503	- 2.1	4.6	4.1	4.9	
	504	- 1.4	6.4	4.0	6.3	
	505	- 1.0	3.4	2.7	3.4	
SUMMARY	- 2.0	5.1	2.1	4.4	5.6	

Table XI (C). Measures of Dispersion, Sweep, Full Automatic, Standing (Continued) (u)

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FIRER	BURST	AV V	SIG V	S V	AV AB V	VRMS -	AV H	SIG H	S H
1	436	0	9.7	6.7	9.3	6.4	7.8	8.2	5.7
	437	- 1.2	5.8	5.1	5.6	- 0.2	5.7	5.7	3.5
	438	- 2.8	2.5	3.2	3.7	- 2.8	5.7	5.7	3.5
	439	- 2.4	7.8	5.2	7.8	- 0.9	5.7	5.7	3.9
	440	- 0.8	3.7	3.1	3.6	- 0.0	3.9	3.9	3.9
SUMMARY	- 1.1	6.4	1.5	4.7	6.4	- 2.5	5.5	5.5	3.4
2	196	- 1.8	3.8	3.4	4.1	- 2.0	2.6	2.6	2.6
	197	- 1.7	3.2	2.7	3.5	- 2.3	3.4	3.4	2.9
	198	- 0.3	5.3	4.0	5.1	- 1.8	3.9	3.9	3.9
	199	- 3.7	4.0	4.0	5.3	- 1	3.8	3.8	3.8
	200	- 9.1	5.2	9.1	10.4	- 0	5.8	5.8	5.8
SUMMARY	- 2.5	4.4	4.2	4.6	6.2	- 1.4	4.0	4.0	3.9
3	316	- 9.4	9.2	11.1	12.3	- 1.3	5.4	5.4	5.4
	317	- 2.6	5.0	4.7	5.5	- 1.8	2.9	2.9	2.9
	318	- 0.9	8.1	6.5	7.8	- 0.4	4.3	4.3	4.3
	319	- 3.4	6.2	5.6	6.9	- 1.4	3.9	3.9	3.9
	320	- 2.8	9.3	7.6	9.3	- 4.6	3.7	3.7	3.7
SUMMARY	- 3.9	7.7	3.2	7.1	8.8	- 1.2	4.2	4.2	2.3
4	236	- 0.9	6.3	5.1	6.1	- 1.5	3.7	3.7	3.7
	237	- 4.0	3.6	4.2	5.2	- 0.8	4.4	4.4	4.4
	238	- 5.5	3.1	5.5	6.2	- 1.4	4.3	4.3	4.3
	239	- 5.5	3.5	5.7	6.5	- 1.3	5.1	5.1	5.1
	240	- 3.3	4.4	4.3	5.3	- 1.2	6.3	6.3	6.3
SUMMARY	- 3.8	4.4	1.9	5.0	5.9	- 0.3	5.9	5.9	1.4
5	476	- 3.6	4.5	4.8	5.6	- 0.2	3.9	3.9	3.9
	477	- 13.7	11.8	14.2	17.8	- 2.6	5.1	5.1	5.1
	478	- 16.4	10.1	16.7	19.0	- 3.1	4.3	4.3	4.3
	479	- 4.9	15.4	13.0	15.5	- 5.4	7.5	7.5	7.5
	480	- 9.0	4.9	8.3	9.3	- 0.7	9.7	9.7	9.7
SUMMARY	- 9.3	10.5	5.6	11.4	14.7	- 0.9	6.6	6.6	3.3
6	276	- 2.4	3.4	3.9	4.3	- 1.6	5.3	5.3	5.3
	277	- 6.8	4.5	6.9	8.0	- 2.6	3.5	3.5	3.5
	278	- 7.2	2.8	9.2	9.6	- 4.3	2.7	2.7	2.7
	279	- 5.0	3.0	5.0	5.8	- 0.4	3.9	3.9	3.9
	280	- 10.4	3.8	10.8	12.2	- 1	4.0	4.0	4.0
SUMMARY	- 5.8	4.3	3.1	7.1	8.5	- 1.0	4.0	4.0	1.8

Table XII (C). Measures of Dispersion, Point, Controlled Burst, Standing (U)

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FIRER	FURST	AV V	SIG V	SV	AV AB V	VRMS	AV H	SIG H	SH
7	156	- 5.5	4.7	5.8	7.1	.2	3.1		
	157	- 2.8	9.2	8.1	9.6	.6	7.7		
158	-	7.6	5.7	7.6	9.4	-	3.9		
159	-	3.7	5.6	5.7	6.5	-	3.8	9.8	
160	-	10.0	6.3	10.0	11.7	-	3.7		
SUMMARY	-	6.1	6.5	2.7	7.4	9.0	-	1.7	2.6
8	356	.8	7.3	6.0	7.0	-	.9	3.3	
	357	- 4.1	5.8	6.3	6.9	-	1.9	3.5	
358	-	10.6	4.7	10.6	11.5	-	2.3	3.3	
359	-	6.1	5.1	6.2	7.8	-	10.5	4.2	
360	-	3.5	4.6	4.5	5.6	.9	3.8		
SUMMARY	-	4.7	5.6	4.1	6.7	7.7	-	2.9	4.4
9	116	- 6.1	6.3	7.9	8.6	1.2	3.9		
117	-	8.5	3.8	8.5	9.2	-	3.2	2.2	
118	-	7.7	6.6	9.7	11.5	1.5	3.6		
119	-	6.4	9.5	8.7	11.1	1.6	4.1		
120	-	10.4	2.6	10.4	10.7	.2	4.9		
SUMMARY	-	8.2	6.2	1.9	9.0	10.2	.3	3.9	2.0
10	396	- 6.9	6.5	8.2	9.3	8.7			
397	-	7.9	6.0	4.6	6.4	-	1.8	3.0	
398	-	6.9	10.2	10.8	12.0	-	2.3	4.6	
399	-	4.3	4.8	5.6	6.3	-	1.4	8.1	
400	-	5.9	5.2	6.9	8.5	1.7	4.2		
SUMMARY	-	5.6	6.9	1.9	7.2	8.8	2.1	7.4	4.0
11	516	- 5.9	3.2	6.0	6.6	.1	4.9		
517	-	2.1	3.2	2.8	3.7	-	5.0	5.0	
518	-	4.7	5.9	5.3	7.3	-	2.5	4.4	
519	-	6.5	2.7	6.5	7.0	-	3.8	2.8	
520	-	4.0	3.1	4.5	5.0	-	2.6	2.3	
SUMMARY	-	4.6	3.8	1.7	5.0	6.1	-	2.7	4.0

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Table XII (C). Measures of Dispersion, Point, Controlled Burst, Standing (Continued) (U)

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FIRER	BURST	AV V	SIG V	S V	AV AB V	VRMS	AV H	SIG H	SH
1	431	4.6	5.9	5.9	7.3	5.7	5.2	5.7	5.2
	432	9	10.5	8.2	10.1	6.4	3.3	6.4	3.3
	433	1	6.2	4.9	5.9	4.6	3.9	5.9	3.9
	434	7	6.2	5.2	6.0	-	5.9	5.9	5.9
	435	-	5.1	9.5	10.4	9.6	6.4	6.4	6.4
SUMMARY		2.0	7.9	2.7	6.6	8.2	4.8	5.1	4.4
2	191	6.3	9.5	9.1	12.3	-	4.7	4.7	4.7
	192	9.9	6.9	10.2	11.9	3.9	6.0	6.0	6.0
	193	5.9	6.1	7.6	8.3	8.7	9.3	9.3	9.3
	194	-	5.6	5.4	3.5	5.2	4.3	3.2	3.2
	195	5.6	7.1	6.5	8.8	1.6	2.6	2.6	2.6
SUMMARY		5.8	7.1	4.0	7.4	9.6	3.7	6.2	3.4
3	311	2	7.7	6.2	7.4	5.5	5.9	5.9	5.9
	312	-	1.0	8.0	7.7	9.1	7.4	7.4	7.4
	313	2.1	9.7	7.8	9.5	5.6	6.2	6.2	6.2
	314	2.5	6.5	5.4	6.7	-	2.9	2.9	2.9
	315	1.5	3.9	3.0	4.0	3.6	5.8	5.8	5.8
SUMMARY		1.1	7.4	1.4	5.8	7.3	4.7	5.9	3.4
4	231	1.7	10.5	8.9	10.1	7.4	5.7	5.7	5.7
	232	-	5.2	7.5	7.5	8.8	7.4	7.4	7.4
	233	9.1	8.0	9.6	11.9	2.6	6.7	6.7	6.7
	234	-	9.2	6.1	9.3	10.9	4.4	4.4	4.4
	235	-	3.1	5.2	4.4	5.8	3.3	2.8	2.8
SUMMARY		-	1.3	7.8	7.0	7.9	10.0	4.5	3.3
5	471	3.9	10.9	9.3	11.1	4.2	7.3	7.3	7.3
	472	5.9	6.9	6.8	8.9	4.4	12.1	12.1	12.1
	473	-	4.2	6.3	5.9	7.4	9.9	9.9	9.9
	474	-	5.0	8.3	7.0	9.4	5.1	6.3	6.3
	475	-	6.7	8.7	8.3	10.7	6.6	4.4	4.4
SUMMARY		-	1.2	8.4	5.7	7.5	9.6	4.5	3.4
6	271	2.6	7.4	6.8	7.6	1.5	6.7	6.7	6.7
	272	-	9	6.7	6.0	6.5	9.9	9.9	9.9
	273	-	4.6	6.2	6.5	7.4	11.4	11.4	11.4
	274	-	5.0	6.7	6.1	8.1	6.2	2.7	2.7
	275	-	3.7	3.0	3.6	4.6	10.3	7.9	7.9
SUMMARY		-	1.9	6.2	3.5	5.5	6.9	7.9	6.8

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Table XIII (C). Measures of Dispersion, Point, Full Automatic, Standing (U)

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FIRER	BURST	AV V	SIG V	S V	AV AB V	VRMS	AV H	SIG H	SH
7	151	- 8.0	8.9	8.5	11.7	2.6	11.6		
	152	- 2.6	6.6	5.4	6.9	1.2	3.6		
	153	- 4.4	7.3	6.6	8.2	7.0	4.1		
	154	- 6.8	6.7	6.6	8.0	- 9.7	6.8		
	155	- 1.5	5.2	4.7	5.2	5.5	4.2		
SUMMARY	- 4.3	7.0	2.5	6.4	8.3	1.3	6.8	6.6	
8	351	- 2.5	11.1	7.7	10.9	7.3	5.1		
	352	- 4.3	14.7	11.7	14.4	7.7	7.5		
	353	- 4.5	5.9	5.6	7.2	1.2	8.5		
	354	- 6.9	5.1	7.7	8.3	-	3.1		
	355	- 7.1	9.8	8.7	11.0	2.5	4.0		
SUMMARY	- 5	9.5	5.1	8.3	10.4	2.2	6.1	6.4	
9	111	- 4.7	6.9	6.8	8.1	5.1	7.4		
	112	- 2.0	7.8	6.7	7.7	- 1.6	10.4		
	113	- 5.2	6.7	6.7	8.2	16.8	8.7		
	114	- 1.6	9.6	7.5	9.3	4.1	8.9		
	115	- 1.4	9.1	6.8	8.8	13.1	7.4		
SUMMARY	- 1.6	9.1	3.3	6.9	8.5	7.5	8.6	7.4	
10	391	- 1.3	7.0	5.4	6.8	- 5.1	6.6		
	392	- 4.2	6.2	6.3	7.3	5.5	11.5		
	393	- 4.0	8.6	7.7	9.2	2.5	3.9		
	394	- 6.0	5.8	7.0	8.2	- 1.3	7.2		
	395	- 2.3	5.7	5.1	6.0	- .2	10.9		
SUMMARY	- 3.5	6.9	1.8	6.3	7.6	- .7	8.3	2.8	
11	511	- 5.1	6.7	6.8	8.2	- 1.6	2.4		
	512	- 3.3	6.1	5.3	6.7	- 4.1	4.9		
	513	- .5	2.6	1.8	2.5	- .6	3.9		
	514	- 9.4	8.5	9.5	12.4	- 2.0	5.0		
	515	- 3.0	6.8	4.8	7.0	- .6	2.3		
SUMMARY	- 4.3	6.6	3.3	5.6	8.4	- 1.3	4.0	2.0	

Table XIII (C). Measures of Dispersion, Point, Full Automatic, Standing (Continued) (u)

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Table XIV (c). Summary Across Men, Measures of Dispersion (U)

Condition	\bar{V}	$S_{\bar{V}}$	$\sigma_{\bar{V}}$	σ_v	\bar{V}		$S_{\bar{H}}$	$\sigma_{\bar{H}}$	σ_H
					$ V $	V_{RMS}			
Calibration	-0.4	2.9	1.9	3.4	3.3	4.5	-1.4	1.2	1.6
Sweep - CB	-3.3	3.9	3.5	6.7	6.4	8.5	-	-	-
Sweep - FA	-1.4	4.2	5.6	7.8	7.7	9.8	-	-	-
Point - CB	-5.2	2.4	3.2	6.3	6.8	8.7	-0.7	1.8	2.7
Point - FA	-0.9	3.0	4.1	7.6	6.7	8.7	3.6	3.0	4.5

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17 JAN 68 PAGE 21

FIRER	BURST			
	1	2	3	4
1	7.3	8.8	14.8	18.7
2	9.8	9.2	6.5	6.2
3	4.0	7.6	9.6	6.5
4	4.5	3.0	4.0	3.3
5	6.3	6.3	6.5	3.0
6	7.5	8.4	6.0	8.8
7	8.4	7.6	10.8	8.2
8	4.5	5.0	3.7	8.6
9	6.0	5.4	6.6	9.7
10	10.3	5.0	6.1	5.3
11	4.7	4.1	3.7	4.6

Average 6.3 mils. Standard Deviation 3.4 mils

Table XV (C). Extreme Spread, Calibration, Controlled Burst, Standing, November 1966 (u)

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Table XVI (C). Extreme Spread, Three-round Burst, Low and High Rate of Fire, Standing, March 1967, Summary Table (U)

Rate of Fire (approximate)	Number of Fires	Number of Bursts	Extreme Spread (Mils)	Standard Deviation (Mils)
2000 spm	9	90	7.4	3.8
450 spm	9	90	14.5	7.2

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Table XVII (c). Extreme Spread, Three-round Burst, Low Rate of Fire, Standing, March 1967, Individual Burst (U)

FIRER	BURST									
	1	2	3	4	5	6	7	8	9	10
1	15.3	10.1	11.1	5.4	11.4	2.9	2.0	12.2	5.3	4.2
2	23.3	10.6	12.7	15.8	30.8	20.9	18.5	16.8	10.1	11.9
3	8.9	13.9	13.4	16.2	14.6	12.1	29.0	6.5	14.9	9.2
4	22.6	11.7	7.2	15.4	29.6	19.9	30.5	12.0	21.5	15.0
5	9.6	7.4	15.2	9.4	7.2	21.9	12.4	13.1	6.9	11.8
6	9.9	2.8	11.2	17.3	10.9	8.1	19.1	11.6	7.7	9.9
7	18.6	21.5	7.7	8.5	9.7	19.9	21.8	11.1	23.7	8.2
8	9.0	15.6	15.3	21.3	34.9	13.9	12.1	27.7	15.7	24.1
9	8.3	15.1	30.0	5.1	8.9	10.5	21.4	22.4	28.4	10.5

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1. Mode: full automatic
2. Condition: standing
3. Rate-of-Fire: approximately 450 spm
4. Rounds per Burst: 3
5. Lot Number(s) of Ammunition: 4
6. Date Fired: March 1967
7. No. of Firears: 9

Table XVIII (c). Extreme Spread, Three-round Burst, High Rate of Fire, Standing, March 1967, Individual Burst (U)

FIRER	BURST					9
	1	2	3	4	5	
1	4.8	4.5	7.3	3.4	5.6	6.6
2	10.0	10.2	8.4	5.9	8.6	8.4
3	2.9	4.3	5.5	13.0	3.7	6.0
4	6.4	12.8	9.6	2.7	8.1	8.0
5	4.3	7.6	3.1	4.9	5.0	2.0
6	9.0	6.1	3.8	6.5	2.5	7.2
7	7.6	6.5	6.6	4.5	9.6	14.7
8	17.7	6.9	4.7	14.7	6.3	7.9
9	9.4	8.4	8.6	13.2	11.1	10.4
						7.1
						9.0
						7.3
						14.0
						10

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1. Mode: controlled burst
2. Condition: standing
3. Rate-of-Fire: approximately 2000 spm
4. Rounds per Burst: 3
5. Lot Number(s) of Ammunition: 4
6. Date Fired: March 1967
7. No. of Firers: 9

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FIRER BURST

	1	2	3
1	V - 1.4 -	5.7 -	4.2
	H - 14.8 -	1.2	.2
	V - 2.3 -	4.1	5.6
	H - .6	.9	3.6
	V - 2.7 -	9.2	13.4
	H - 1.8	.2	1.0
	V - 1.6 -	3.4	5.4
	H - .9	2.8	4.6
	V - 13.2 -	1.8	6.5
	H - .5	.2	2.5
	V - 1.0 -	3.0	3.0
	H - .4	1.2	1.7
	V - 3.6 -	2.8	2.0
	H - .4	.5	.7
	V - 3.6	1.8	6.0
	H - 1.3	1.7	2.1
	V - 2.2 -	.5	4.5
	H - 1.9	.0	2.8
	V - 4.0 -	2.5	2.5
	H - 2.1 -	1.1	1.8

	4	V - 8.1 -	2.2 -	16.4
		H - 3.0	14.0	18.0
		V - 5.6	4.4	4.5
		H - 2.7	2.2	6.3
		V - 8.5	5.1	7.8
		H - .4	2.4	7.6
		V - 6.9	.3	8.4
		H - .5	.6	13.7
		V - 3.9	2.9	3.5
		H - 3.7	7.2	25.0
		V - 9.0	1.8	4.7
		H - 3.7	15.4	18.2
		V - 2.9	5.1	3.5
		H - 2.5	12.1	28.0
		V - 12.2	3.4	3.3
		H - .4	3.2	7.7
		V - 9.3	.9	11.3
		H - 1.4	1.7	5.7
		V - 6.0	1.8	5.7
		H - 1.3	7.6	8.0

2	V - 21.4	9.8	7
	H - .7	5.8	7.0
	V - 7.3	2.2	10.8
	H - 5.6	2.6	2.7
	V - 6.1	2.6	1.0
	H - .2	1.9	10.4
	V - 5.3	3.3	4.9
	H - 3.4	2.0	8.8
	V - 6.7	9.7	21.0
	H - 3.1	9.3	11.7
	V - 9.1	1.8	10.8
	H - 2.7	.5	3.7
	V - 6.3	11.7	.6
	H - 3.1	7.0	7.9
	V - 3.9	3.7	14.6
	H - 1.7	2.3	4.9
	V - 3.9	1.0	2.2
	H - 2.6	6.7	10.8
	V - 4.8	7.1	1.8
	H - 2.5	3.1	4.6

5	1	2	3
	V - 13.6	7.7	11.0
	H - 2.5	1.5	6.5
	V - 7.9	9.5	3.6
	H - 1.3	6.0	7.3
	V - 7.9	3.0	9.0
	H - .8	9.2	10.6
	V - 6.9	8.1	9.2
	H - .2	5.6	9.3
	V - 3.3	8.8	6.0
	H - 4.6	.0	1.4
	V - 8.1	8.0	1.8
	H - 4.1	7.0	16.9
	V - .3	8.1	4.5
	H - 8.8	.9	1.4
	V - 8.0	2.9	5.3
	H - .6	6.1	10.1
	V - 5.8	5.2	2.6
	H - 5.3	.6	.9
	V - 9.1	.4	9.6
	H - 4.1	3.5	4.0

3	1	2	3
	V - 1.2	1.9	3.2
	H - 1.6	4.3	9.3
	V - 1.7	6.9	2.6
	H - 3.0	9.0	16.8
	V - 6.8	.0	5.0
	H - .2	3.1	13.4
	V - 1.2	.8	7.2
	H - .7	4.1	13.6
	V - 3.9	5.1	6.9
	H - 1.2	4.0	10.9
	V - 5.0	10.5	17.0
	H - 1.5	2.0	3.0
	V - 1.5	1.5	18.0
	H - 4.5	3.5	17.0
	V - 5.5	7.0	13.5
	H - .5	4.5	3.5
	V - 1.0	8.5	13.5
	H - .5	1.0	4.0
	V - 1.5	6.0	9.0
	H - .5	3.5	5.8

Table XIX (C). Co-ordinates, Three-round Burst, Low Rate of Fire, Standing, March 1967 (U)

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6 V - 8.7 - 5.9 - 12.3
H - 4.9 - .4 4.4
V - 6.2 - 3.7 - 5.1
H - 1.7 - .7 - .7
V - 6.0 - 12.2 - 11.1
H - 1.9 .5 8.0
V - 5.7 - 3.7 - 8.4
H - 3.8 4.6 13.3
V - 6.7 - 7.5 - 13.0
H - 2.5 1.7 6.4
V - 4.7 - 9.1 - 4.4
H - 2.5 3.9 5.0
V - 4.5 - 9.4 - 16.3
H - 6.2 4.6 8.8
V - 9.3 - 3.1 - 9.0
H - 4.2 4.2 7.3
V - 7.7 - 9.1 - 4.3
H - 4.3 - 2.9 2.6
V - 5.2 1.0 - 8.1
H - 2.3 1.8 5.1

8 V - 11.9 - 16.2 - 12.5
H - 2.4 3.1 11.1
V - 5.6 4.2 - 11.1
H - .9 1.4 4.6
V - 1.0 - 6.7 7.1
H - 4.3 2.2 7.8
V - .8 7.0 18.3
H - 6.7 .0 5.5
V - 2.1 15.3 30.5
H - 10.0 5.2 10.4
V - 3.7 - 7.5 - 12.3
H - 1.4 9.3 12.3
V - 3.0 1.4 2.9
H - 4.8 3.4 5.8
V - 12.8 14.8 - 1.4
H - 3.0 4.9 9.4
V - 1.5 20.1 7.8
H - 1.9 .5 7.5
V - 5.6 2.7 6.2
H - 3.4 8.1 17.6

7 1 2 3
V - 4.1 14.3 .2
H - 1.9 3.9 4.5
V - 13.3 .3 7.4
H - 1.6 5.8 7.2
V - 9.0 - 9.4 - 3.1
H - 2.0 4.6 6.8
V - 6.6 - 2.2 - 1.6
H - 3.2 4.2 10.1
V - 11.1 - 2.0 - 4.4
H - 4.0 7.3 9.9
V - 3.7 - 4.8 - 7.4
H - 9.2 2.3 10.3
V - 14.7 - 7.1 1.7
H - .6 - .3 6.6
V - 3.4 - .4 - 9.5
H - .5 7.7 9.4
V - 6.6 - 8.5 - 23.0
H - 1.9 7.8 15.1
V - 5.1 - 8.5 - 5.7
H - .7 3.7 8.8

9 1 2 3
V - 4.0 - 1.6 - 3.4
H - 2.2 6.4 10.5
V - 9.1 - 3.4 - 16.9
H - 2.7 11.6 14.5
V - 38.6 - 8.7 - 12.8
H - 1.3 3.9 7.7
V - 11.7 - 16.1 - 14.0
H - 6.1 8.8 8.9
V - 2.7 - 9.9 - 2.2
H - 1.6 5.3 8.0
V - 9.9 - 10.1 - 7.9
H - 3.3 8.4 13.6
V - 23.9 - 8.7 - 5.9
H - 3.2 11.2 14.8
V - 8.7 - 5.6 12.6
H - 4.5 10.1 11.4
V - 8.5 - 1.1 - 15.6
H - 3.7 5.2 18.6
V - .4 - 5.9 - 7.9
H - 1.0 .2 6.4

Table XIX (C). Co-ordinates, Three-round Burst, Low Rate of Fire, Standing, March 1967 (Continued) (U)

¹⁰³
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FIRER BURST		1	2	3	4	V - 5.4 - .9 - 4.3	H - 2.0 - 2.5 - 2.8
1	V	4.3 - .5	.9		V - 4.9 - 4.8 - 8.0	H - 2.6 - 3.9 - 4.4	
	H	.7 - .6	.0		V - 8.6 - 7.9 - 1.0	H - 5.4 - .8 - .3	
	V	7.0 - 5.8 -	3.2		V - 3.4 - 4.8 - 2.9	H - 1.2 - .5 - 1.3	
	H	1.9 - .5	.5		V - 7.8 - 5.8 - 13.5	H - 2.5 - 2.9 - 5.4	
	V	4.6 - 6.4 -	4.7		V - 4.5 - 9.4 - 2.6	H - .8 - .2 - 4.0	
	H	7.7 - 6.7 -	.4		V - 12.0 - 10.3 - 3.4	H - 1.4 - 2.7 - 3.6	
	V	.7 - 3.3 -	1.1		V - 9.3 - 9.1 - 2.6	H - 4.6 - 1.5 - 1.7	
	H	2.9 - .8 -	.3		V - 4.8 - 13.5 - 10.7	H - .5 - 2.4 - 2.7	
	V	4.6 - 8.3 -	7.1		V - 10.8 - 13.0 - 9.3	H - 2.2 - 4.0 - 9.1	
	H	3.6 - 3.3 -	1.3				
	V	1.0 - 3.0 -	1.5				
	H	5.8 - 1.4 -	.3				
	V	1.5 - 5.5 -	2.7				
	H	5.7 - 4.8 -	1.5				
	V	3.9 - 3.8 -	2.4				
	H	3.7 - 3.3 -	2.4				
	V	1.0 - 4.0 -	3.0				
	H	4.2 - 3.3 -	.8				
	V	4.9 - 4.0 -	4.4				
	H	4.2 - 3.4 -	1.8				
2	V	2.9 - 2.3 -	2.3				
	H	4.0 - 1.7 -	4.5				
	V	.2 - 7.5 -	1.9				
	H	9.6 - 2.6 -	1.7				
	V	1.2 - 7.9 -	1.8				
	H	.2 - 5.2 -	6.4				
	V	8.3 - 9.0 -	5.3				
	H	2.5 - .5 -	2.6				
	V	.3 - 3.0 -	3.9				
	H	8.7 - 1.6 -	.9				
	V	3.0 - 2.1 -	4.5				
	H	4.0 - .4 -	4.3				
	V	.9 - 4.2 -	14.2				
	H	4.1 - 3.1 -	2.0				
	V	.0 - .3 -	3.8				
	H	23.1 - .5 -	1.4				
	V	1.4 - 2.1 -	8.3				
	H	2.5 - .4 -	2.5				
	V	.8 - 4.2 -	5.3				
	H	9.2 - 3.2 -	2.4				
3	V	1 - 2.1 -	.2				
	H	.7 - .0 -	.3				
	V	2.1 - .3 -	1.7				
	H	4.5 - 3.8 -	.2				
	V	.9 - 1.5 -	.2				
	H	.4 - 1.8 -	5.0				
	V	5.3 - 2.5 -	6.5				
	H	.8 - 2.0 -	4.9				
	V	1.7 - .6 -	.9				
	H	1.2 - .5 -	2.4				
	V	4.1 - 5.6 -	3.6				
	H	.9 - 4.4 -	6.9				
	V	3.2 - 3.7 -	2.6				
	H	.9 - 2.6 -	3.5				
	V	4.7 - 5.0 -	2.2				
	H	4.5 - 1.3 -	4.1				
	V	3.9 - 2.3 -	2.1				
	H	1.9 - 2.3 -	3.2				
	V	5.7 - 4.8 -	4.0				
	H	1.1 - 1.5 -	5.6				

Table XX (C). Co-ordinates, Three-round Burst, High Rate of Fire, Standing, March 1967 (U)

¹⁰⁴
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6 V - 8.7 - 10.4 - 5.9
 H - 6.9 - 1.2 - 1.6
 V - 3.2 - 4.8 - 8.0
 H - 4.4 - 1.5 - .7
 V - 4.9 - 6.0 - 6.6
 H - 3.8 - 1.6 - .3
 V - 2.7 - 3.9 - 6.1
 H - 6.7 - 6.4 - 1.2
 V - 5.7 - 6.9 - 8.1
 H - 1.9 - 1.9 - 1.5
 V - 5.6 - 4.3 - 8.8
 H - 4.0 - 4.0 - 1.7
 V - 9.2 - 5.9 - 8.5
 H - 6.8 - 5.8 - 1.4
 V - 6.8 - 11.2 - 10.4
 H - 2.8 - .2 - .3
 V - 5.2 - 6.4 - 6.0
 H - 1.3 - .7 - .3
 V - 6.8 - 4.2 - 7.0
 H - 4.0 - 1.8 - .6

8 V - 11.1 - 3.2 - 7.0
 H - 8.5 - 5.8 - 8.8
 V - 9.7 - 6.8 - 3.8
 H - 6.1 - 5.4 - 2.5
 V - 1.9 - 4.0 - 3.7
 H - 2.9 - .6 - 1.5
 V - 6.2 - 1.7 - 14.3
 H - 3.8 - 2.4 - 5.2
 V - 2.1 - 4.2 - .1
 H - .8 - .4 - .1
 V - 2.1 - 8.2 - 9.0
 H - 3.7 - 1.5 - .1
 V - .3 - .8 - .3
 H - 4.4 - 3.0 - 1.7
 V - .5 - 3.9 - .4
 H - .9 - .6 - .1
 V - 8.9 - .9 - 3.0
 H - 12.3 - 8.1 - 4.5
 V - 3.2 - 1.8 - 1.8
 H - 2.4 - 1.0 - 2.9

7 1 2 3
 V - .8 - 3.3 - 6.7
 H - 2.0 - 1.2 - 1.2
 V - 3.5 - 9.4 - 5.1
 H - 2.3 - .6 - 2.7
 V - 2.3 - 3.2 - 5.4
 H - 4.2 - .2 - 1.7
 V - 1.9 - 2.4 - 4.4
 H - 2.8 - .1 - 1.0
 V - 5.0 - 12.3 - 3.1
 H - 5.7 - 4.0 - 1.4
 V - 14.8 - 5.5 - 19.4
 H - .9 - 2.4 - 7.1
 V - 4.4 - 6.0 - 1.1
 H - 5.0 - 2.0 - 1.9
 V - 7.4 - 3.2 - 11.4
 H - .1 - .3 - 3.1
 V - 2.9 - 3.7 - .2
 H - 2.7 - .5 - 3.5
 V - 4.4 - 4.3 - 7.8
 H - .2 - 1.4 - 2.5

9 1 2 3
 V - 2.7 - 5.6 - 11.6
 H - .5 - 1.9 - 3.5
 V - 1.6 - 6.7 - 9.8
 H - .3 - .8 - 1.4
 V - 4.4 - 9.7 - 12.2
 H - 2.2 - 1.2 - 1.3
 V - 2.5 - 14.3 - 9.1
 H - 5.2 - .8 - 2.6
 V - 1.4 - 7.3 - 11.4
 H - 9.1 - 7.2 - 4.3
 V - 8.0 - 16.1 - 11.2
 H - 6.7 - .2 - 2.1
 V - 21.5 - 16.2 - 15.1
 H - .8 - .9 - 4.0
 V - 18.2 - 10.4 - 9.7
 H - 2.8 - 3.8 - 6.1
 V - 12.6 - 19.8 - 16.4
 H - 1.6 - .7 - 1.6
 V - 1.4 - 12.5 - 15.3
 H - 5.0 - 5.5 - 6.7

Table XX (C). Co-ordinates, Three-round Burst, High Rate of Fire, Standing, March 1967 (Continued) (U)

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Table XXI. Verification Test, Impacts Within the Zone of Consideration
(Summary Table)

Firer	Mode	Rds Fired	RANGE												
			50		100		200		300		400		500		
			*	bh	**	th		bh	th		bh	th		bh	th
1	CB	58	29	58	32	48	30	34	22	25	18	21	14	17	
2		59	30	59	36	56	33	39	23	26	21	21	15	15	
3		56	29	56	32	45	27	32	24	27	19	21	17	18	
4		59	31	55	18	32	10	12	9	9	7	7	5	5	
5		60	28	51	19	22	9	10	5	6	4	5	3	3	
6		59	28	59	26	47	21	27	17	18	15	16	9	9	
7		57	35	55	32	43	22	24	14	14	8	8	6	6	
8		57	26	53	24	36	14	18	12	13	9	10	7	7	
9		49	27	48	25	37	20	24	12	13	11	11	8	8	
10		52	24	47	24	38	22	24	20	20	17	18	13	13	
11		58	28	58	29	44	21	28	18	21	13	16	12	14	
	Total	624	315	599	297	448	229	272	176	192	142	154	109	115	
1	FA	56	45	55	40	41	21	21	15	15	12	12	8	8	
2		55	38	48	26	27	15	15	12	12	11	11	8	8	
3		52	43	50	36	36	26	26	19	19	12	12	7	7	
4		39	34	37	26	26	13	13	4	4	3	3	3	3	
5		58	35	44	27	30	15	16	12	12	10	10	9	9	
6		52	42	45	30	32	14	14	9	9	8	8	7	7	
7		53	39	49	26	27	18	18	12	12	6	6	6	6	
8		48	32	39	21	23	12	13	10	10	9	9	7	7	
9		57	49	53	33	34	20	20	16	16	13	13	9	9	
10		50	42	46	41	42	27	27	18	18	12	12	9	9	
11		60	48	59	47	52	33	35	22	22	17	17	15	15	
	Total	580	447	525	353	370	214	218	149	149	113	113	88	88	

* Blocks Hit
** Total Hits

Table XXII. Verification Test, Multiple Hits vs. Range

Mode	Range (yards)					
	50	100	200	300	400	500
FA	1	8	1	-	-	-
	2	9	1	-	-	-
	3	7	-	-	-	-
	4	3	-	-	-	-
	5	7	3	1	-	-
	6	3	2	-	-	-
	7	6	1	-	-	-
	8	5	2	1	-	-
	9	3	1	-	-	-
	10	4	1	-	-	-
	11	8	3	2	-	-
Total		63	15	4	-	-
CB	1	18	15	4	3	3
	2	20	17	5	2	-
	3	19	13	-	3	2
	4	16	10	-	-	-
	5	16	3	1	1	-
	6	19	13	6	1	1
	7	17	10	2	-	-
	8	18	9	4	1	1
	9	15	11	4	1	-
	10	15	12	2	-	1
	11	19	13	7	3	2
Total		192	126	42	15	12

Table XXIII. Trigger-Pull Rate by Individual and Test Condition (trigger pulls per second)

Firer	Verification Test		Pseudo-Tactical Test			
	Sweep Target	Point Target	Controlled-Burst		Trigger Manipulated	
	Supported Position	Standing Position	Supported Position	Standing Position		
1	1.6	1.7	1.3	1.3	1.2	1.3
2	1.9	-	-	-	-	-
3	2.5	2.9	1.4	-	1.0	1.0
4	1.6	1.3	-	-	-	-
5	1.7	2.6	1.0	1.0	1.0	0.9
6	2.2	2.4	1.4	1.3	1.3	-
7	3.7	2.7	-	-	-	-
8	2.4	2.1	1.4	1.3	1.1	1.2
9	1.7	1.2	-	1.3	-	1.4
10	2.1	1.6	1.3	1.2	1.0	1.0
11	1.9	1.6	1.3	1.7	1.2	1.2
High	3.7	2.9	1.4	1.7	1.3	1.4
Low	1.6	1.2	1.0	1.0	1.0	0.9
Average	2.1	2.0	1.3	1.3	1.1	1.1

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Table XXIV (C). Pseudo-Tactical Test Data (U)

MODE: CB

POSITION: STANDING

FIRER	TRIAL	ROUNDS FIRED	SECONDS OF ENGAGEMENT	HITS PER TARGET										TARGETS HIT	TOTAL HITS
				1	2	3	4	5	6	7	8	9	10		
1															
	1	18	4.0	2	1	1	1	-	-	-	-	-	-	4	5
	2	24	6.6	-	1	-	1	-	-	-	1	-	-	3	3
	3	27	6.5	2	1	-	2	2	1	1	2	-	-	7	11
	4	27	6.5	1	2	2	2	1	1	3	1	-	-	8	13
	5	27	6.5	1	3	1	2	1	2	1	1	2	-	9	14
3															
	1	30	6.0	2	-	-	-	-	1	2	-	-	-	3	5
	2	24	6.5	3	1	-	-	2	-	-	2	-	-	4	8
	3	30	8.0	-	-	-	2	1	-	-	-	-	-	2	3
	4	24	6.5	1	1	2	-	1	2	2	1	-	-	7	10
	5	20	4.5	-	-	1	-	1	1	1	-	-	-	4	4
5															
	1	18	6.6	-	-	-	-	-	-	-	-	-	-	-	-
	2	18	7.0	1	-	1	-	-	-	-	-	-	-	2	2
	3	17	6.6	-	1	1	-	-	1	-	-	-	-	3	3
	4	30	7.2	1	-	-	1	-	1	-	-	-	-	3	3
	5	18	7.4	2	-	-	1	-	3	-	-	-	-	3	6
6															
	1	30	6.2	1	2	2	-	-	-	-	-	-	-	3	5
	2	27	7.0	-	-	2	1	-	-	-	2	-	-	3	5
	3	26	7.5	-	-	-	2	2	-	2	-	-	-	3	6
	4	23	6.2	-	3	2	1	3	-	1	1	-	-	6	11
	5	28	7.2	1	1	2	1	1	2	2	1	-	-	8	11
7															
	1	30	6.8	1	-	1	-	1	1	-	-	-	-	1	5
	2	30	7.2	-	-	1	1	-	1	1	2	1	2	7	9
	3	30	6.2	1	1	1	-	-	1	1	-	1	-	6	6
	4	30	7.4	-	-	-	-	2	1	1	1	1	-	5	6
	5	21	6.0	1	-	2	-	-	1	2	-	-	-	4	6

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Table XXIV (C). Pseudo-Tactical Test Data (Continued) (U)

MODE: CB

POSITION: STANDING

FIRER	TRIAL	ROUNDS FIRED	SECONDS OF ENGAGEMENT	HITS PER TARGET										TARGETS HIT	TOTAL HITS	
				1	2	3	4	5	6	7	8	9	10			
8	1	15	4.5	-	1	-	2	3	X	X	X	X	X	3	5	6
	2	24	6.5	3	2	2	2	2	2	1	-	-	-	7	14	
	3	24	6.5	2	1	2	-	1	-	-	3	-	-	5	9	
	4	27	7.0	3	2	3	3	2	2	-	2	-	-	7	17	
	5	26	5.5	-	2	1	-	1	2	-	1	-	-	5	7	
9	1	24	5.5	1	-	2	-	-	-	-	-	-	-	2	3	
	2	18	6.5	1	-	-	1	-	-	-	-	-	-	2	3	
	3	27	7.2	1	1	2	1	1	2	-	-	-	-	6	8	
	4	27	7.0	2	2	2	1	3	3	-	1	-	-	7	14	
	5	21	7.0	2	1	3	-	-	1	-	-	-	-	4	7	
10	1	24	6.6	1	-	1	1	1	1	-	-	-	-	5	5	
	2	24	7.2	1	1	1	1	1	1	2	-	-	-	7	8	
	3	27	6.8	1	2	3	3	3	1	1	2	2	-	9	18	
	4	21	6.8	1	1	-	-	1	2	1	1	-	-	6	7	
	5	23	6.8	1	2	1	1	-	1	1	1	-	-	7	8	
11	1	27	7.0	-	1	2	-	-	-	2	1	-	-	4	6	
	2	30	6.8	-	-	1	1	-	1	-	-	2	-	4	5	
	3	30	7.0	2	1	2	-	3	-	1	1	-	3	7	13	
	4	27	6.8	2	1	-	1	2	1	2	-	2	-	7	11	
	5	27	7.0	-	1	1	-	1	2	2	1	-	-	6	8	

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Table XXV (C). Pseudo-Tactical Test Data (U)

MODE: TM

POSITION: STANDING

FIRER	TRIAL	ROUNDS FIRED	SECONDS FIRED	ENGAGEMENT	HITS PER TARGET										TARGETS HIT	TOTAL HIT
					1	2	3	4	5	6	7	8	9	10		
1	25	6.5	1	-	1	2	-	-	-	-	-	-	-	-	3	4
2	25	6.5	1	-	1	1	-	1	1	-	-	-	-	-	5	5
3	27	7.0	-	2	-	-	-	1	2	1	-	-	-	-	4	6
4	25	6.0	-	-	1	-	-	2	1	-	-	-	-	-	3	4
5	30	7.2	-	-	-	-	1	-	-	-	-	-	-	-	1	1
3																
1	30	5.5	-	-	2	-	-	1	-	-	-	-	-	-	2	3
2	22	6.4	1	-	-	-	1	1	-	-	-	-	-	-	3	3
3	20	5.5	-	1	1	2	1	-	-	-	-	-	-	-	4	5
4	30	8.0	2	1	3	-	-	1	-	-	-	-	-	-	4	7
5	30	6.8	-	-	1	1	1	1	-	-	-	-	-	-	4	4
5																
1	13	7.2	2	1	1	-	-	-	-	-	-	-	-	-	3	4
2	21	7.0	1	-	-	1	-	1	1	-	-	-	-	-	4	4
3	23	6.8	1	-	-	-	-	1	-	-	-	-	-	-	2	2
4	16	7.2	-	-	-	1	-	-	-	-	-	-	-	-	1	1
5	17	7.0	2	2	-	-	1	3	1	-	-	-	-	-	5	9
6																
1	27	7.2	-	-	1	1	-	2	2	-	-	1	5	7		
2	30	7.2	1	-	-	-	-	1	-	-	1	-	3	3		
3	24	6.8	-	1	-	1	1	-	-	1	-	-	4	4		
4	25	7.2	-	1	-	-	2	-	-	1	-	-	3	4		
5	27	7.4	-	1	-	1	3	-	1	-	-	-	4	6		
7																
1	30	6.4	-	-	-	-	1	3	2	1	1	-	5	8		
2	30	7.2	-	-	-	1	-	1	-	-	-	-	2	2		
3	28	7.0	-	1	-	1	-	-	-	-	-	-	2	2		
4	30	6.8	-	3	-	-	1	1	-	-	-	-	3	5		
5	30	6.8	1	1	1	-	-	-	-	-	-	-	3	3		

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Table XXV (C). Pseudo-Tactical Test Data (Continued) (U)

MODE: TM

POSITION: STANDING

FIRER	TRIAL	ROUNDS FIRED	SECONDS OF ENGAGEMENT	HITS PER TARGET										TARGETS HIT	TOTAL HITS
				1	2	3	4	5	6	7	8	9	10		
8															
	1	30	8.0	1	-	1	-	1	-	1	-	-	-	4	4
	2	29	6.4	-	2	-	1	1	1	-	1	-	-	5	6
	3	28	6.5	-	-	-	-	-	1	-	-	-	-	1	1
	4	28	6.8	-	-	1	-	-	-	-	-	-	-	1	1
	5	30	7.0	1	1	1	1	1	-	1	-	-	-	6	6
9															
	1	29	7.0	-	1	1	1	-	-	-	1	-	-	4	4
	2	30	6.5	-	1	-	-	-	-	-	1	-	-	2	2
	3	26	7.0	1	-	1	-	-	1	1	1	-	-	5	5
	4	30	6.5	2	1	1	1	-	-	1	2	-	-	6	8
	5	30	6.5	-	1	-	-	-	-	1	-	-	-	2	2
9															
	1	30	7.2	1	2	-	-	1	1	-	1	-	-	5	6
	2	26	7.2	1	1	1	2	1	1	1	-	-	-	7	8
	3	28	7.2	-	1	-	-	1	1	1	-	-	-	4	4
	4	29	6.4	1	-	1	-	-	-	-	-	-	-	2	2
	5	27	7.0	1	-	1	1	-	3	-	-	-	-	4	6
11															
	1	27	7.0	3	1	-	2	1	-	1	1	1	-	7	10
	2	28	7.2	-	1	-	-	1	-	-	1	-	-	3	3
	3	27	6.8	-	2	1	1	-	1	1	1	-	-	6	7
	4	27	7.4	1	1	-	-	2	-	2	-	-	-	4	6
	5	28	7.5	1	-	-	1	1	-	1	1	1	-	6	6

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Table XXVI (C). Pseudo-Tactical Test Data (U)

MODE: FA

POSITION: STANDING

FIRER	TRIAL	ROUNDS FIRED	SECONDS OF ENGAGEMENT	HITS PER TARGET										TARGETS HIT	TOTAL HITS
				1	2	3	4	5	6	7	8	9	10		
1				-	-	-	-	-	-	-	-	-	-	-	-
	1	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	2	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	3	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	4	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	5	27	3.5	-	-	-	-	1	-	-	-	-	-	1	1
3				-	-	-	-	-	-	-	-	-	-	-	-
	1	30	4.0	1	-	1	-	1	1	-	-	-	-	4	4
	2	30	4.0	-	-	-	1	-	-	-	-	-	-	1	1
	3	30	4.0	1	-	-	-	-	-	-	-	-	-	1	1
	4	30	4.0	-	-	-	-	-	1	-	-	-	-	1	1
	5	17	2.0	1	-	1	1	-	-	1	-	-	-	4	4
5				-	-	-	-	-	-	-	-	-	-	-	-
	1	28	4.2	1	-	1	-	-	-	-	-	1	-	3	3
	2	28	4.2	1	-	1	-	-	1	-	-	-	-	3	3
	3	30	4.0	1	-	-	-	1	-	-	-	-	-	2	2
	4	29	4.0	-	1	-	1	-	1	-	-	1	-	4	4
	5	30	4.0	-	1	1	-	-	-	-	-	-	-	2	2
6				-	-	-	-	-	-	-	-	-	-	-	-
	1	30	4.0	2	1	2	-	-	-	-	-	-	1	4	6
	2	30	4.0	2	2	-	-	-	-	-	-	-	-	2	4
	3	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	4	21	2.8	-	-	-	-	-	-	-	-	-	-	-	-
	5	25	3.0	1	-	-	1	-	1	-	-	-	-	3	3
7				-	-	-	-	-	-	-	-	-	-	-	-
	1	30	4.0	-	-	-	-	-	-	-	-	-	1	1	1
	2	30	3.8	1	-	-	-	1	-	-	-	-	1	3	3
	3	30	3.8	-	2	-	-	1	1	-	-	-	-	3	4
	4	30	3.8	-	1	1	-	-	1	-	-	-	-	3	3
	5	30	3.8	1	1	-	-	-	-	-	-	-	-	2	2

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Table XXVI (C). Pseudo-Tactical Test Data (Continued) (U)

MODE: FA

POSITION: STANDING

FIRER	TRIAL	ROUNDS FIRED	SECONDS OF ENGAGEMENT	HITS PER TARGET										TARGETS HIT	TOTAL HITS
				1	2	3	4	5	6	7	8	9	10		
8	1	30	4.0	-	-	-	-	-	-	-	1	-	-	1	1
	2	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	3	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	4													-	-
	5													-	-
9	1	29	4.0	-	-	-	1	-	-	-	-	-	-	1	1
	2	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	3	30	4.0	1	-	-	-	-	-	-	1	-	-	2	2
	4	30	4.0	-	-	-	1	-	-	-	-	-	-	1	1
	5	30	4.0	-	-	-	-	-	-	1	1	-	-	2	2
10	1	30	4.0	-	2	-	-	-	-	-	-	-	-	1	2
	2	30	4.0	-	-	-	2	-	-	-	-	-	-	1	2
	3	30	4.0	-	-	-	-	1	-	-	-	-	-	1	1
	4	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
	5	30	4.0	-	-	-	-	-	-	-	-	-	-	-	-
11	1	30	4.0	-	-	1	-	-	-	-	-	-	-	1	1
	2	30	4.0		2	-	-	1	-	-	-	-	1	3	4
	3	30	4.0	-	-	-	-	1	-	-	-	-	-	1	1
	4	30	4.0	1	-	-	-	-	-	1	-	-	-	2	2
	5	30	4.0	1	-	-	-	-	-	-	1	-	-	2	2

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APPENDIX D

(UNCLASSIFIED) FIGURES 1D THROUGH 55D, TARGET PHOTOGRAPHS

115 The following page is blank.

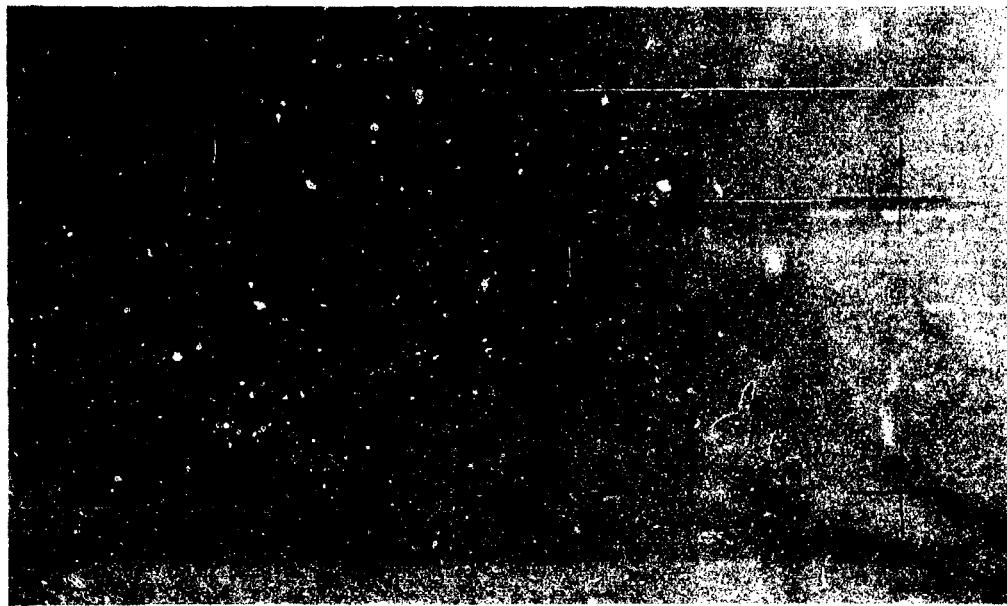


Figure 1D. Calibration, controlled burst, standing, Firer No. 1

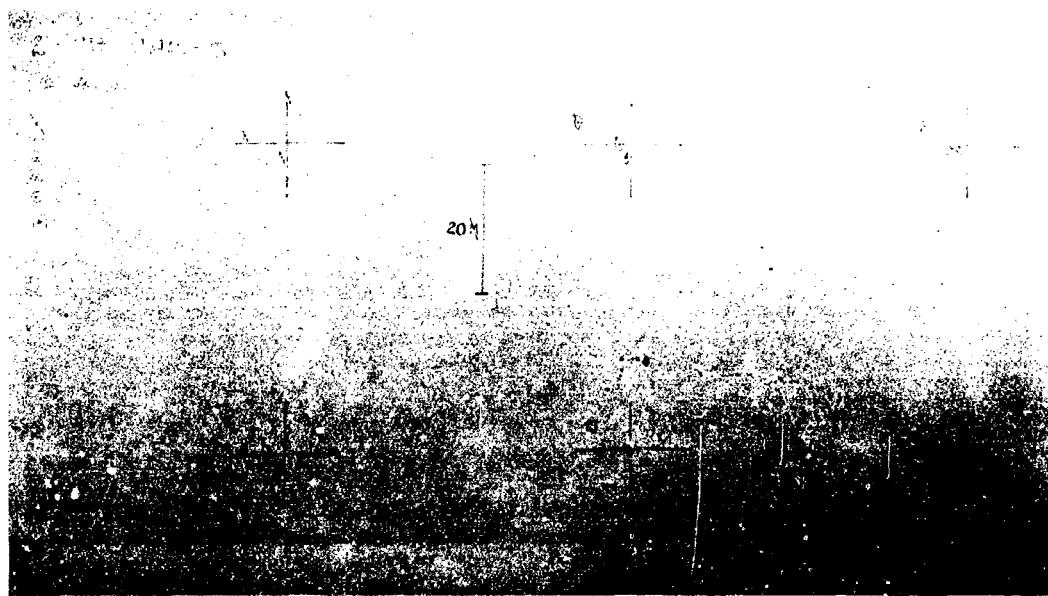


Figure 2D. Calibration, controlled burst, standing, Firer No. 2

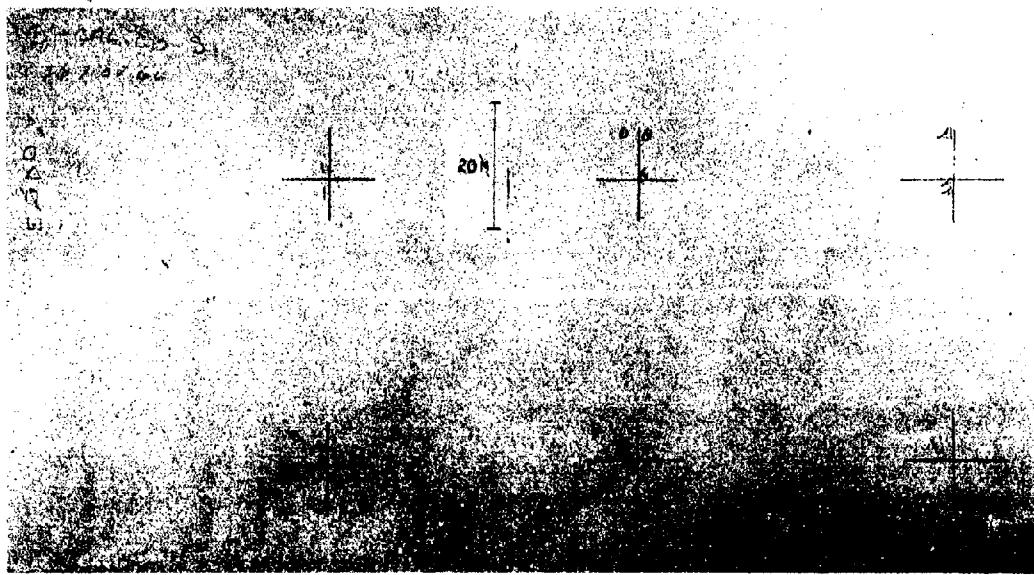


Figure 3D. Calibration, controlled burst, standing, Firer No. 3



Figure 4D. Calibration, controlled burst, standing, Firer No. 4



Figure 5D. Calibration, controlled burst, standing, Firer No. 5

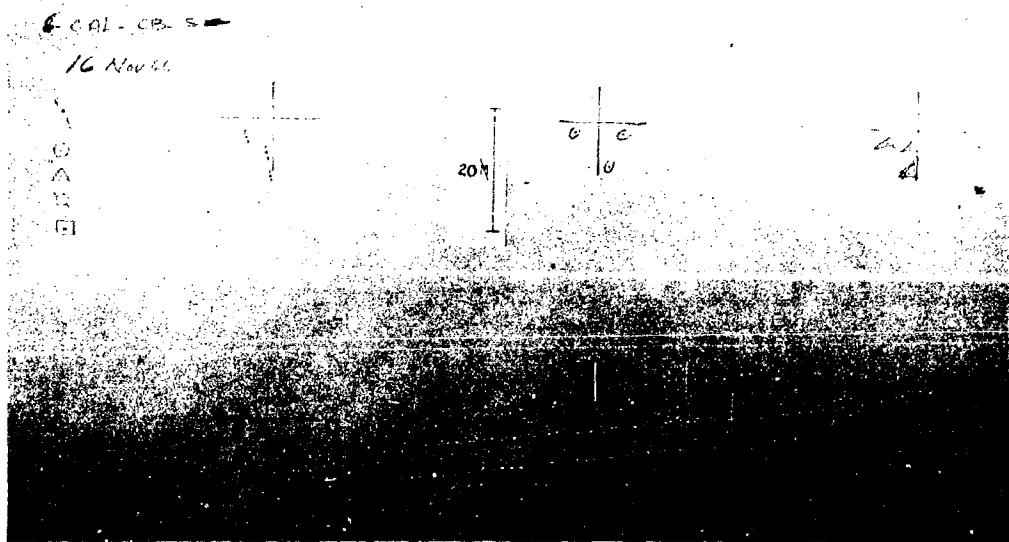


Figure 6D. Calibration, controlled burst, standing, Firer No. 6



Figure 7D. Calibration, controlled burst, standing, Firer No. 7

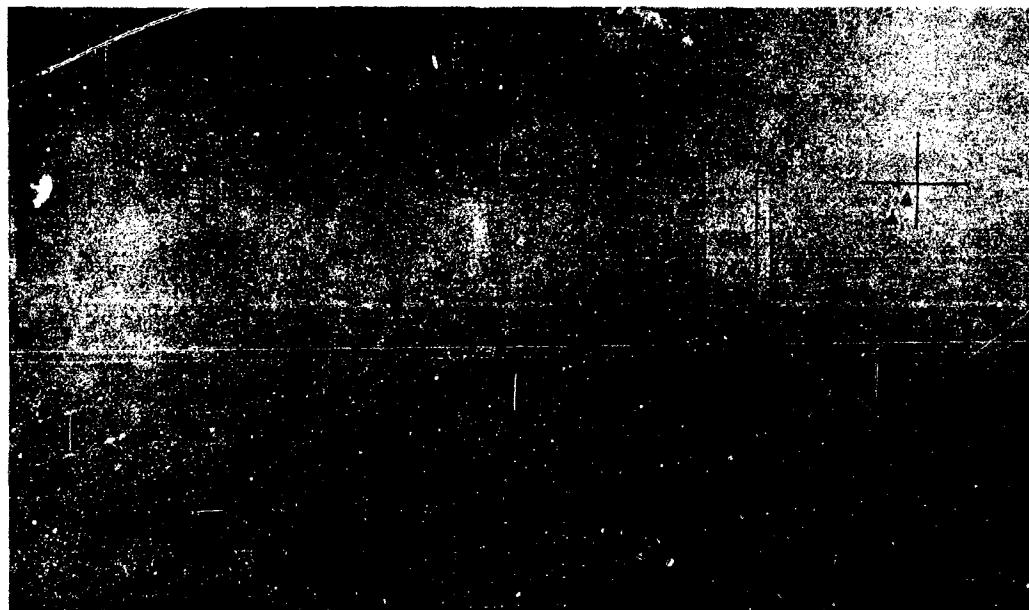


Figure 8D. Calibration, controlled burst, standing, Firer No. 8

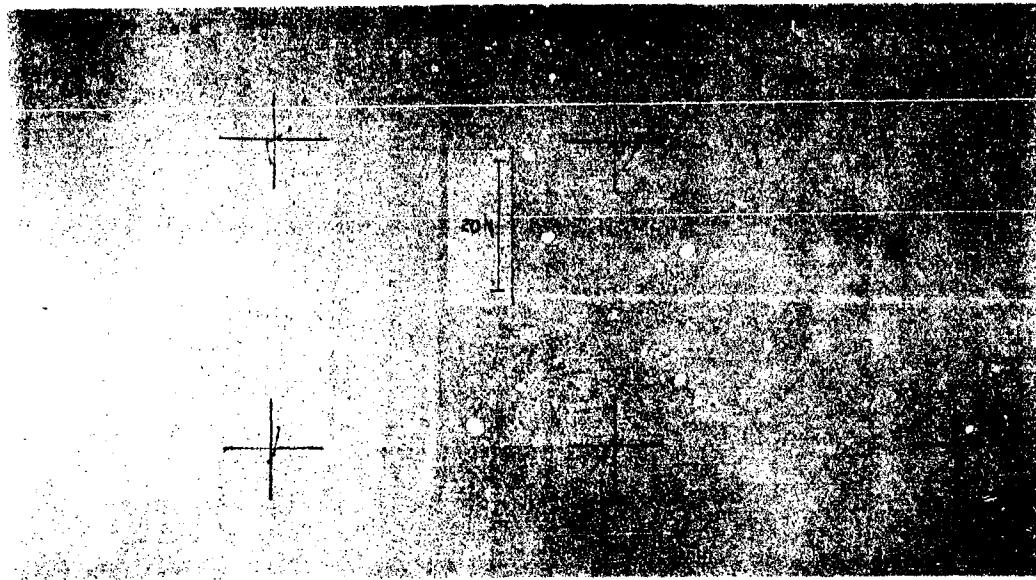


Figure 9D. Calibration, controlled burst, standing, Firer No. 9



Figure 10D. Calibration, controlled burst, standing, Firer No. 10

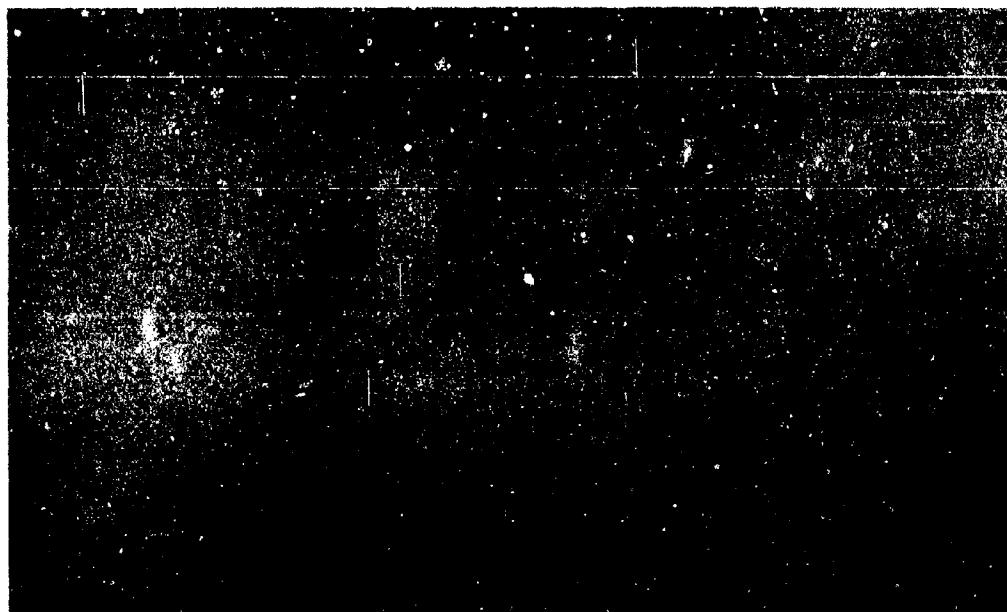


Figure 11D. Calibration, controlled burst, standing, Firer No. 11

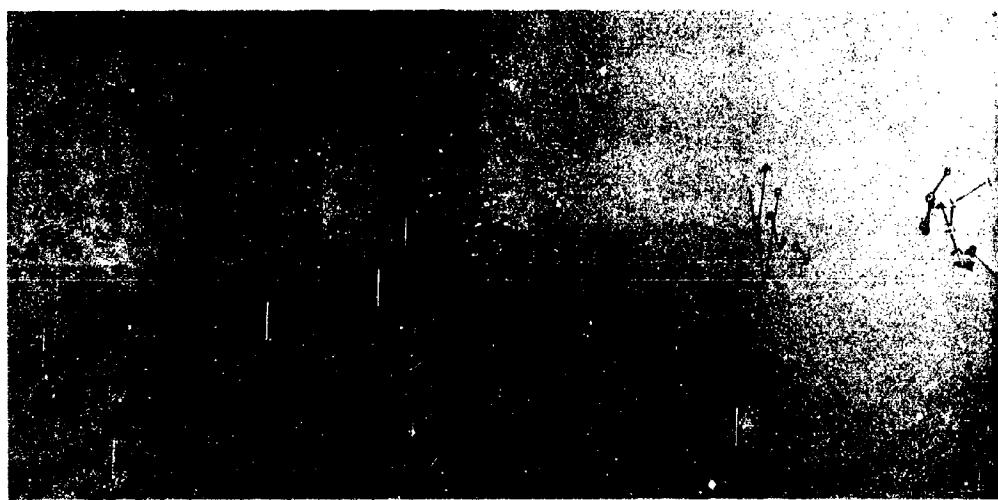


Figure 12D. Controlled burst, sweep target, standing, Firer No. 1

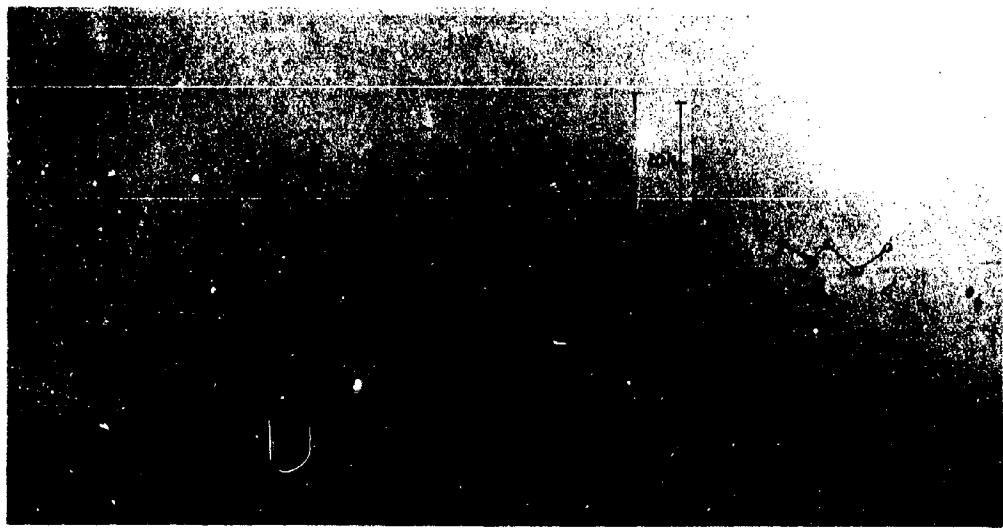


Figure 13D. Controlled burst, sweep target, standing, Firer No. 2

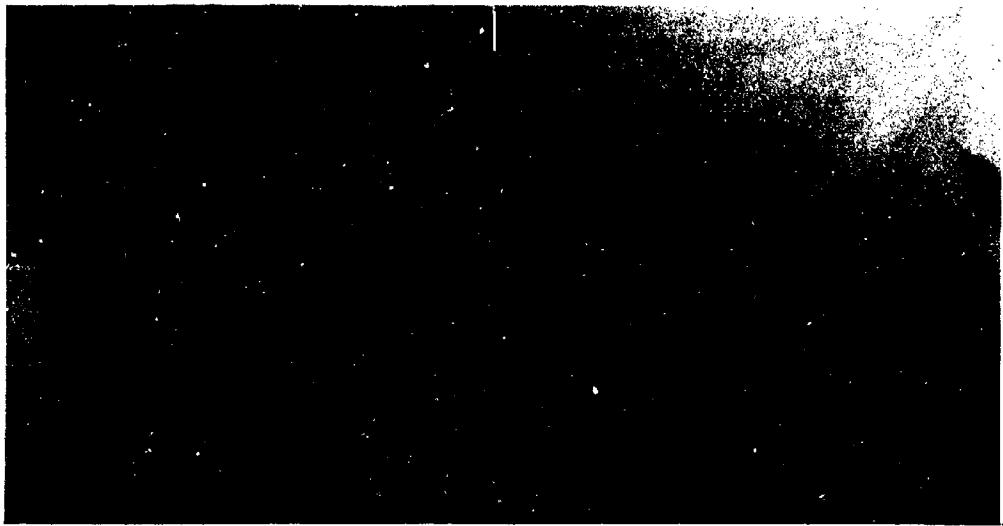


Figure 14D. Controlled burst, sweep target, standing, Firer No. 3



Figure 15D. Controlled burst, sweep target, standing, Firer No. 4

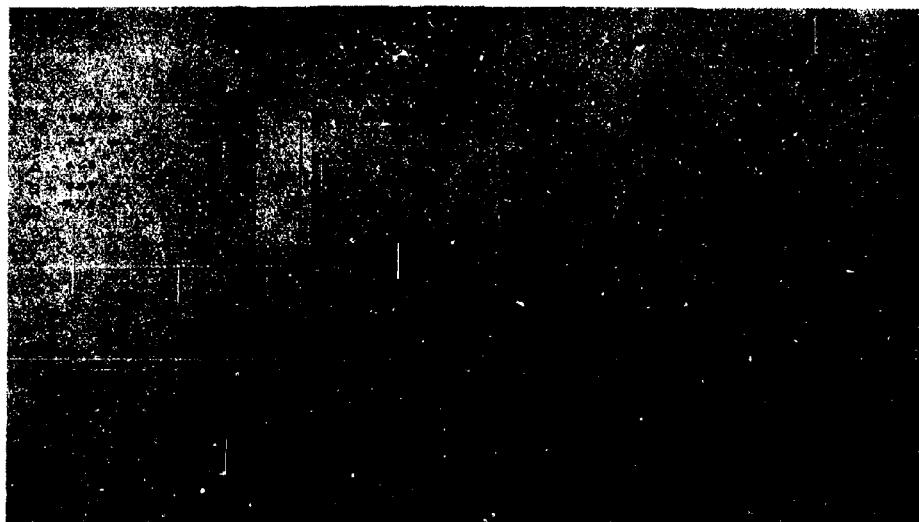


Figure 16D. Controlled burst, sweep target, standing, Firer No. 5



Figure 17D. Controlled burst, sweep target, standing, Firer No. 6



Figure 18D. Controlled burst, sweep target, standing, Firer No. 7

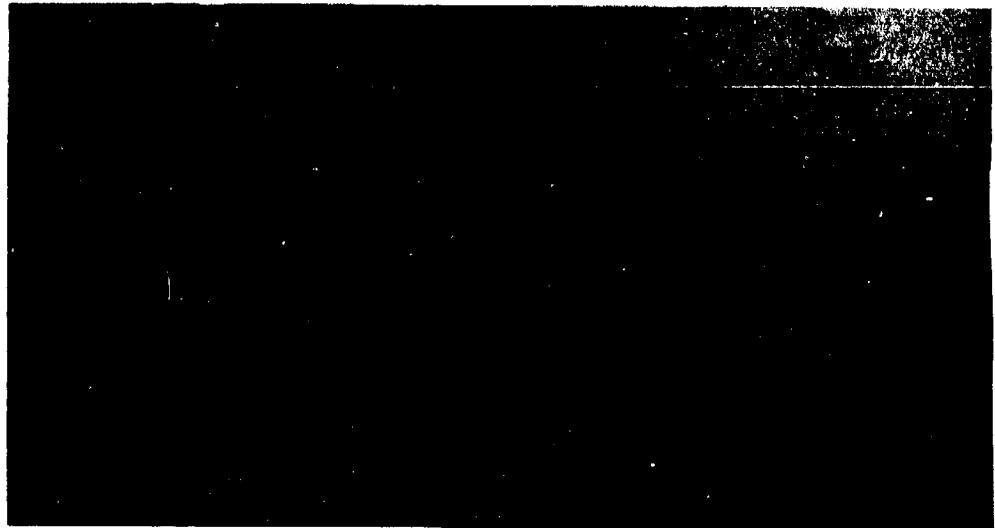


Figure 19D. Controlled burst, sweep target, standing, Firer No. 8



Figure 20D. Controlled burst, sweep target, standing, Firer No. 9



Figure 21D. Controlled burst, sweep target, standing, Firer No. 10



Figure 22D. Controlled burst, sweep target, standing Firer No. 11

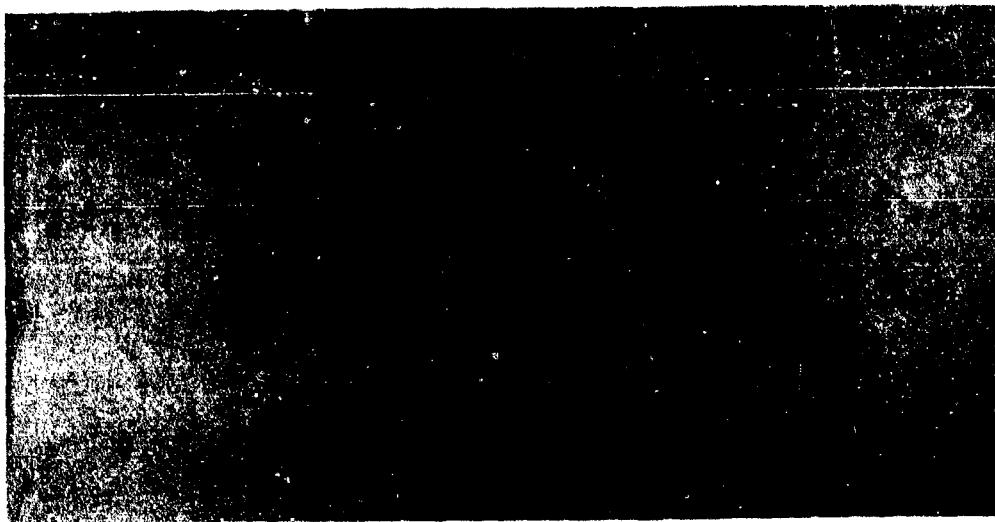


Figure 23D. Full automatic, sweep target, standing, Firer No. 1

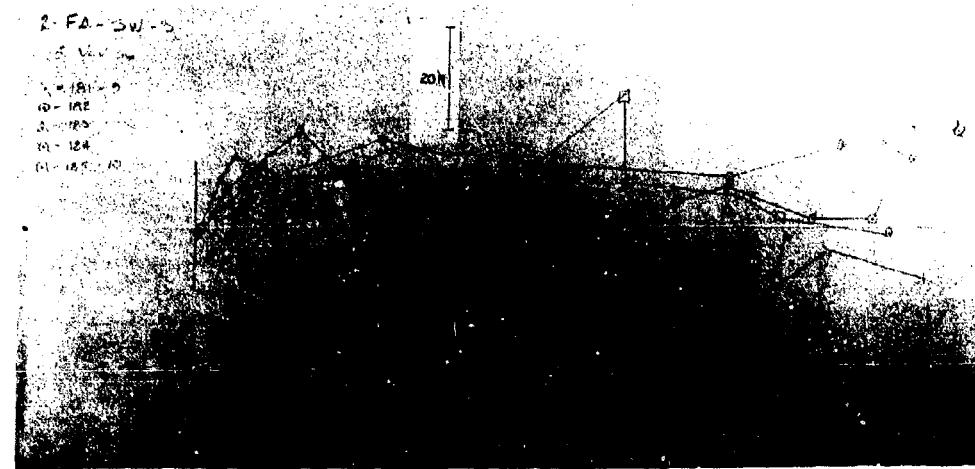


Figure 24D. Full automatic, sweep target, standing, Firer No. 2



Figure 25D. Full automatic, sweep target, standing, Firer No. 3

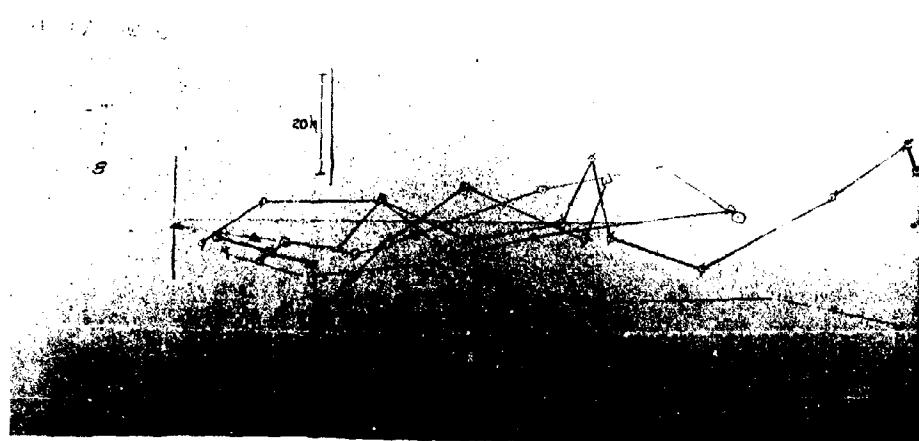


Figure 26D. Full automatic, sweep target, standing, Firer No. 4



Figure 27D. Full automatic, sweep target, standing, Firer No. 5



Figure 28D. Full automatic, sweep target, standing, Firer No. 6

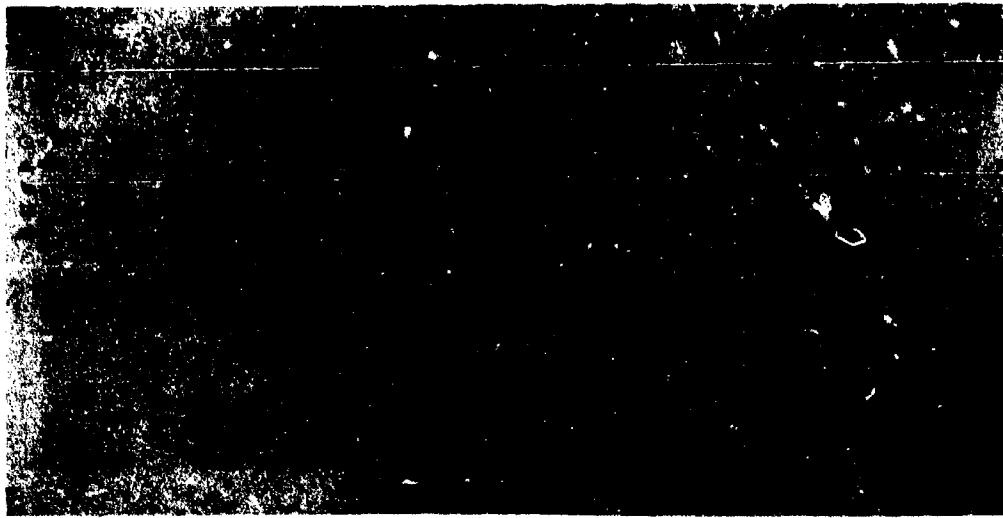


Figure 29D. Full automatic, sweep target, standing, Firer No. 7



Figure 30D. Full automatic, sweep target, standing, Firer No. 8



Figure 31D. Full automatic, sweep target, standing, Firer No. 9



Figure 32D. Full automatic, sweep target, standing, Firer No. 10

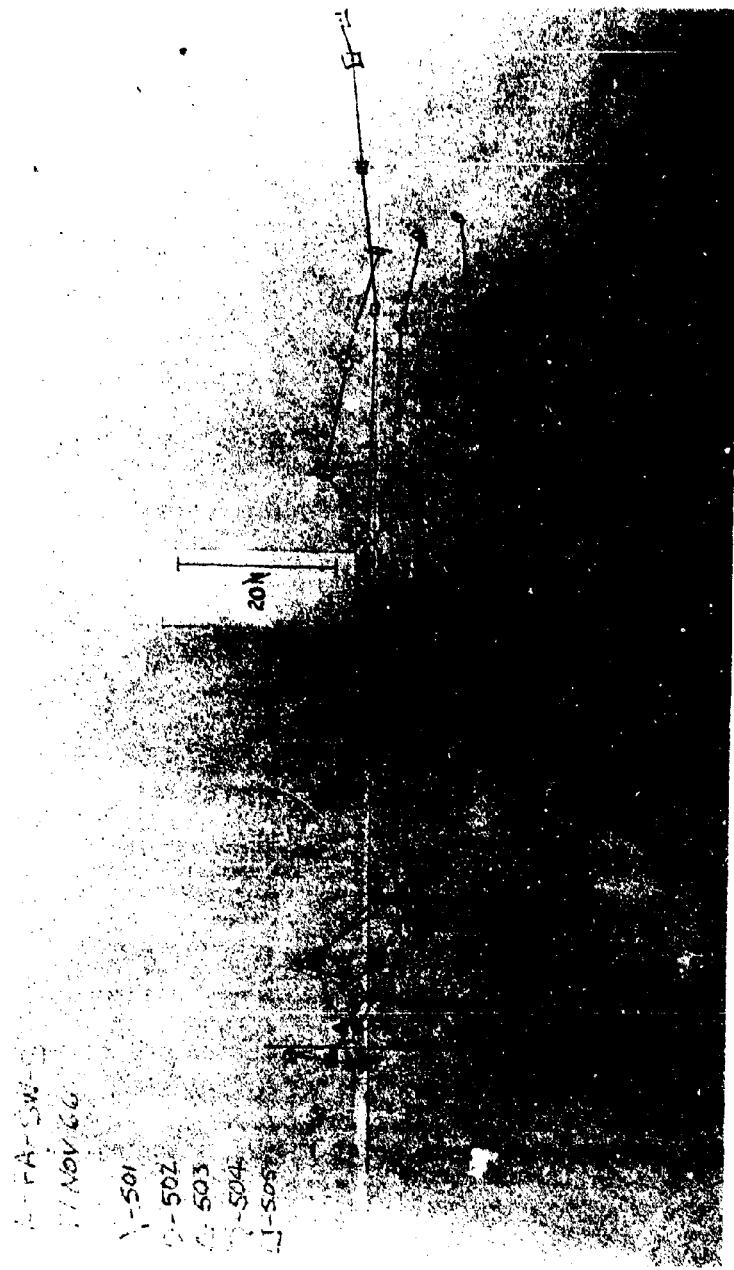


Figure 33D. Full automatic, sweep target, standing, Fifer No. 11

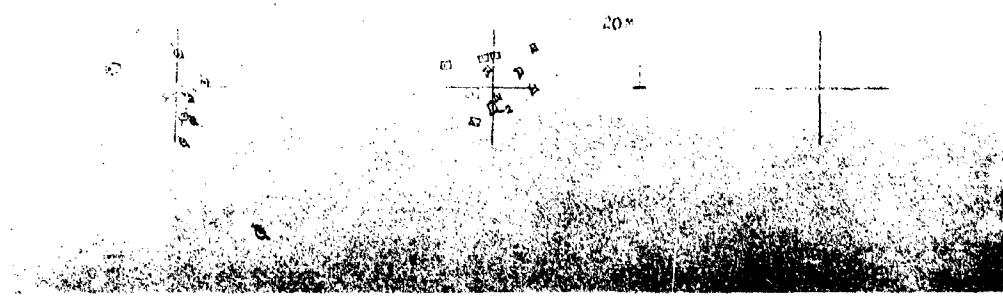
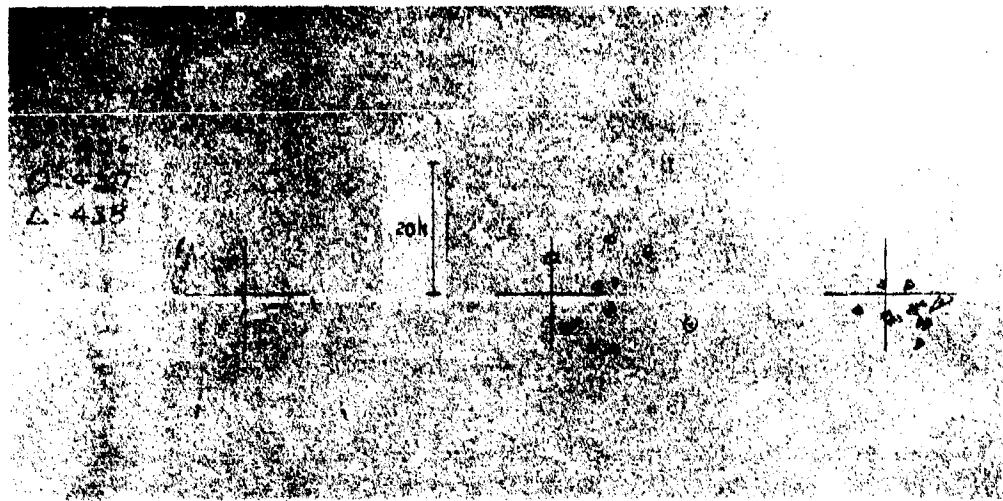


Figure 34D. Controlled burst, point target, standing, Firer No. 1

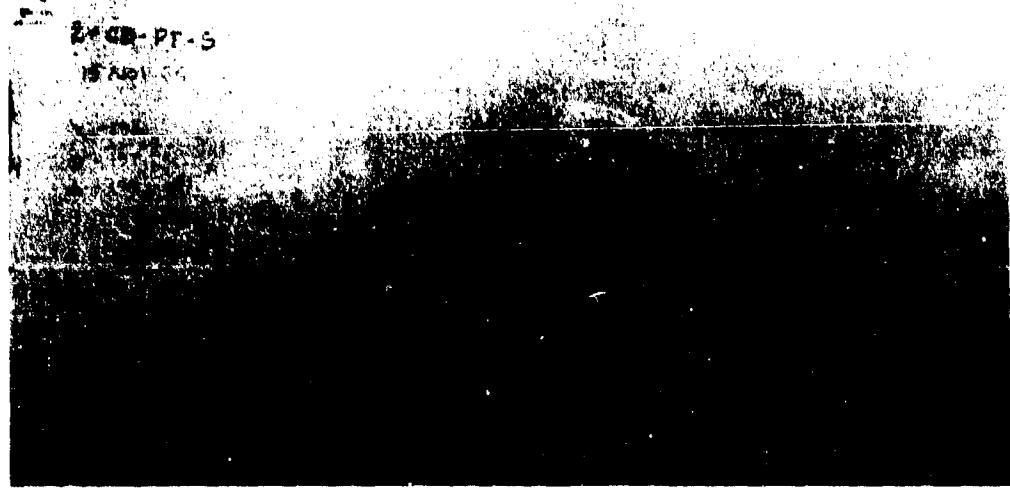


Figure 35D. Controlled burst, point target, standing, Firer No. 2

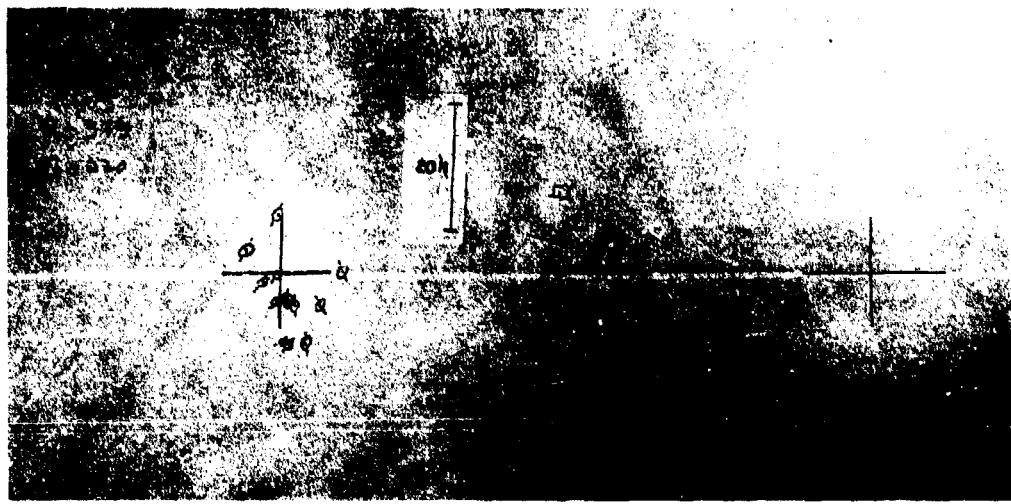
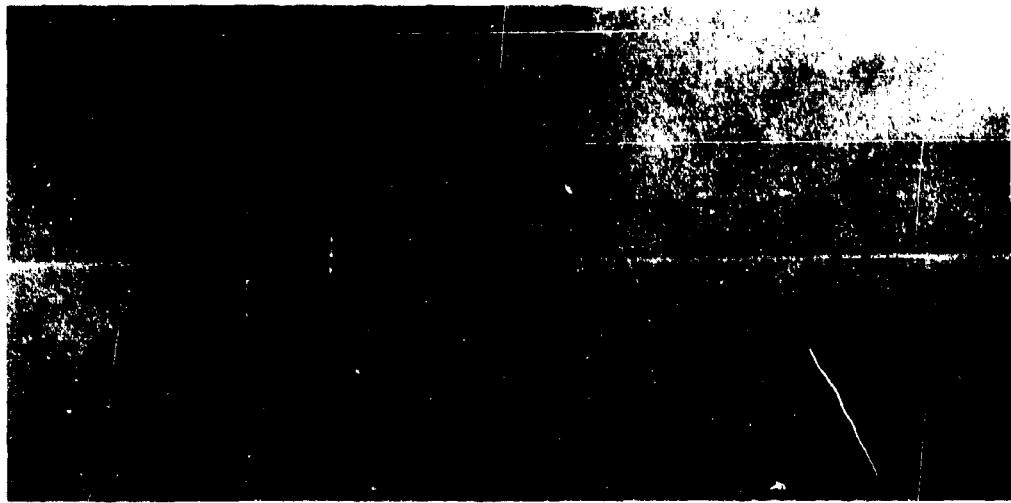
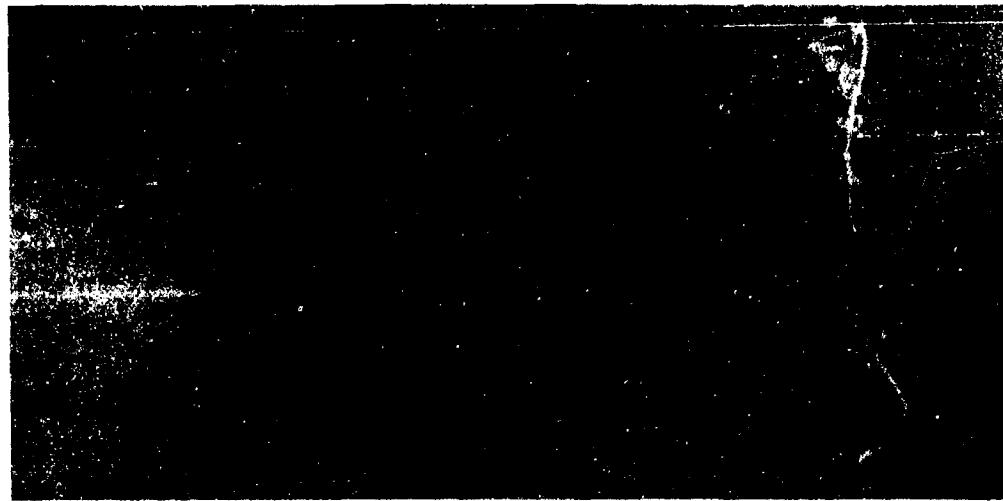


Figure 36D. Controlled burst, point target, standing, Firer No. 3



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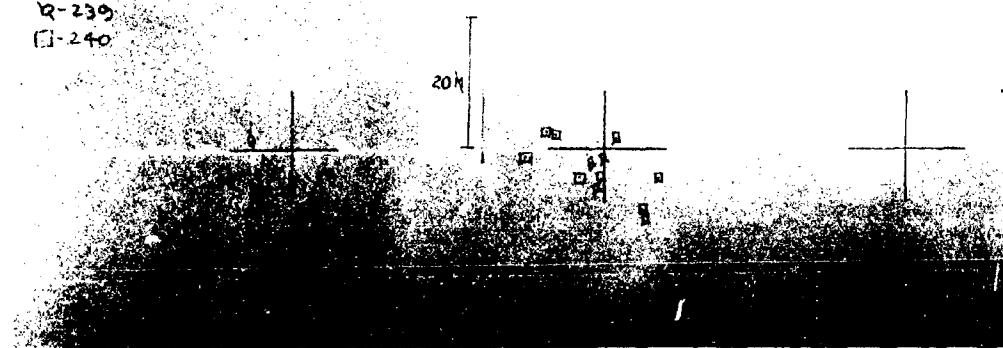


Figure 37D. Controlled burst, point target, standing, Firer No. 4

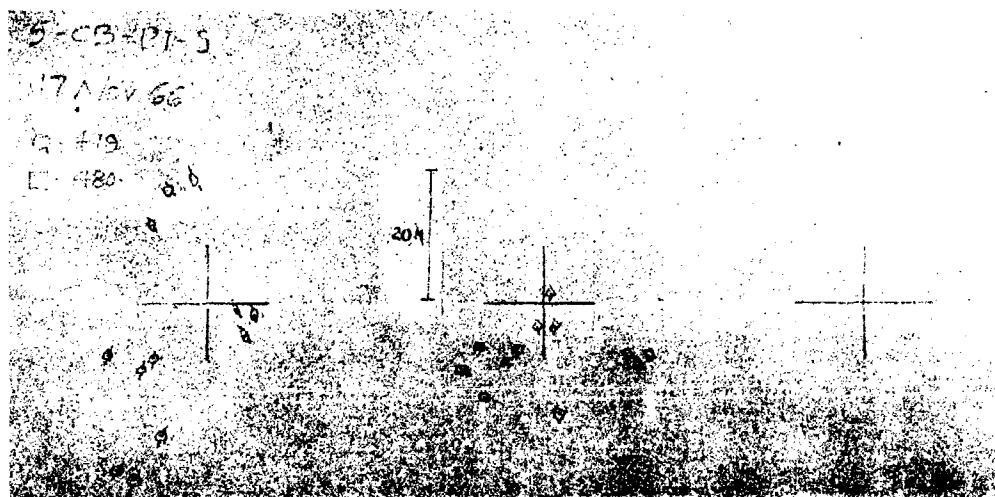
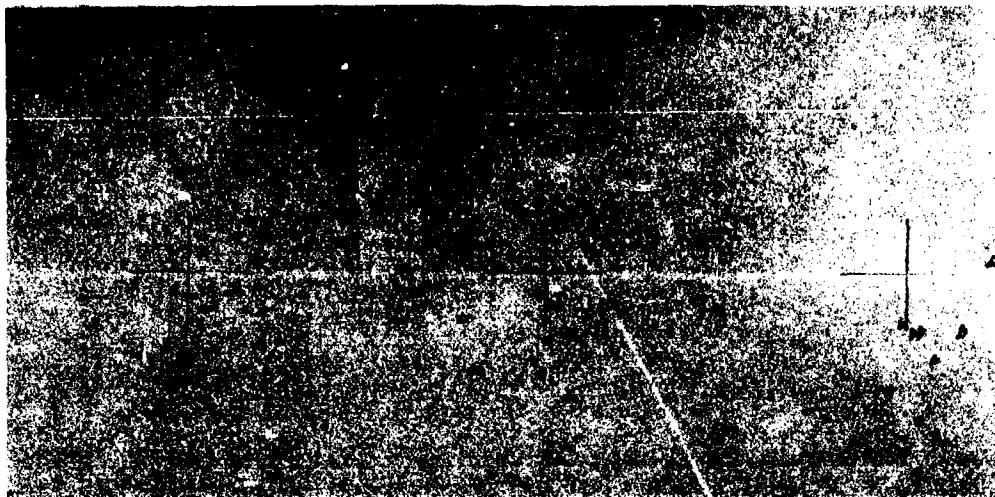


Figure 38D. Controlled burst, point target, standing, Firer No. 5

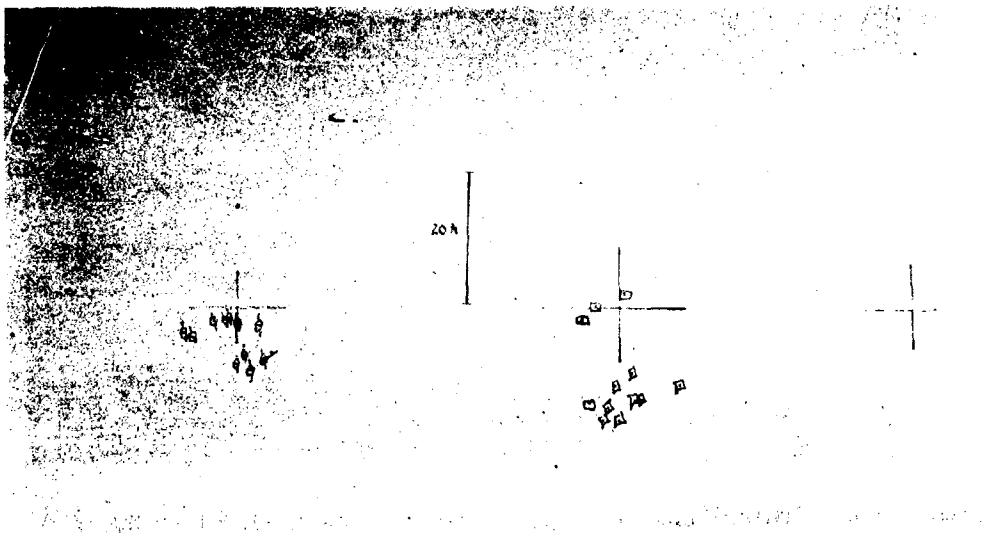


Figure 39D. Controlled burst, point target, standing, Firer No. 6



Figure 40D. Controlled burst, point target, standing, Firer No. 7

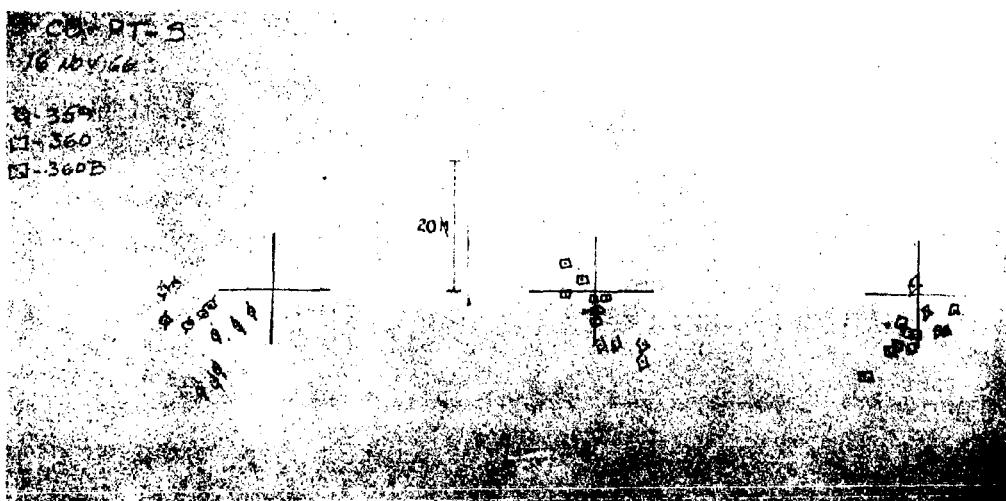


Figure 41D. Controlled burst, point target, standing, Firer No. 8

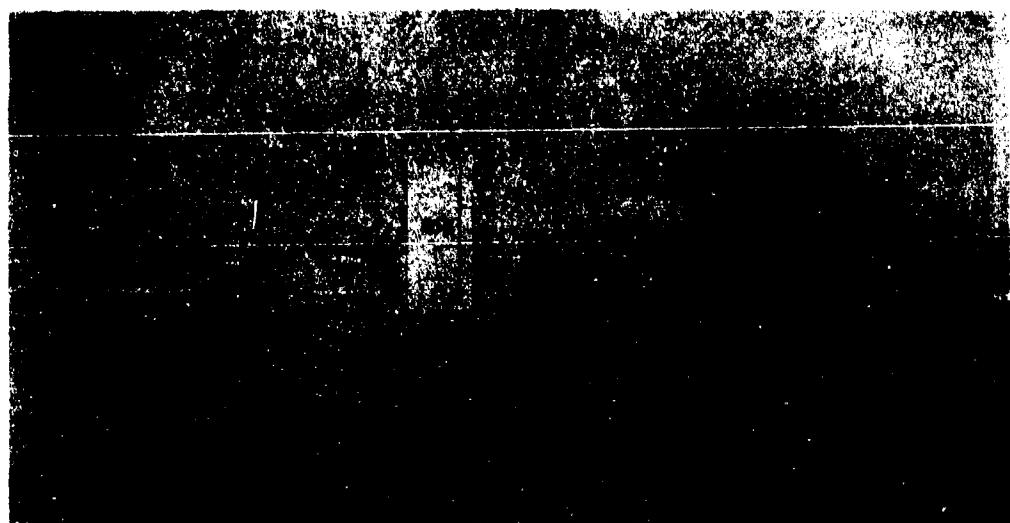


Figure 42D. Controlled burst, point target, standing, Firer No. 9



Figure 43D. Controlled burst, point target, standing, Firer No. 10

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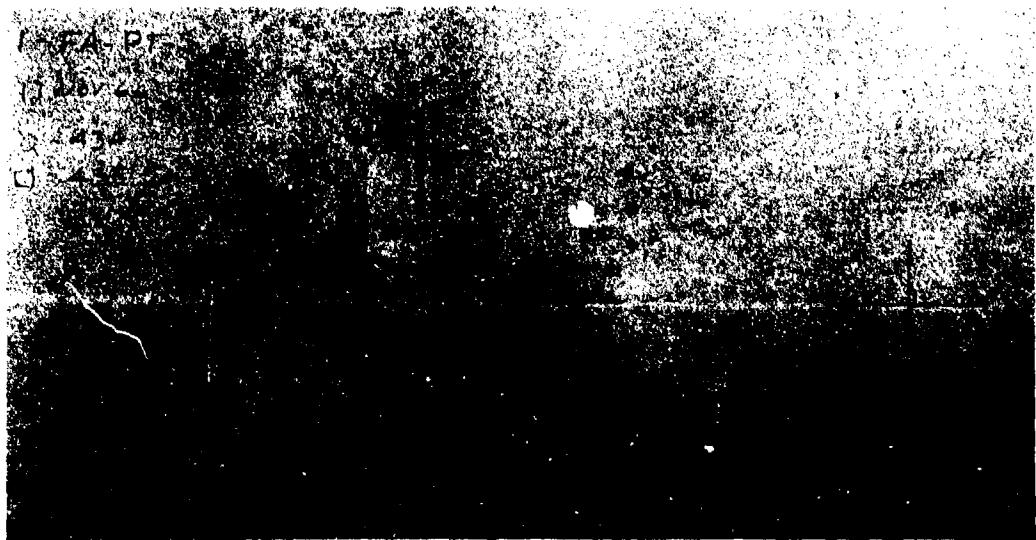


Figure 45D. Full automatic, point target, standing, Firer No. 1

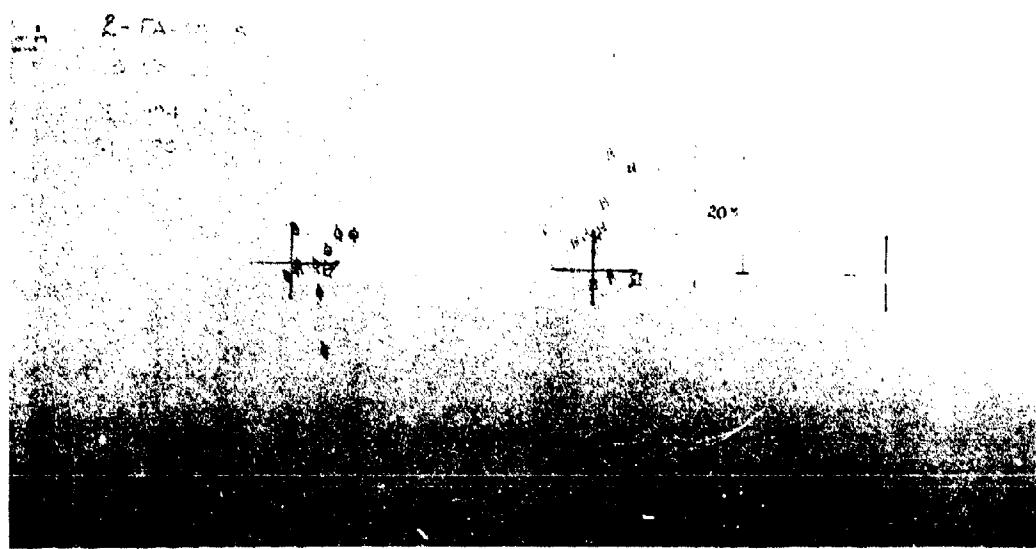
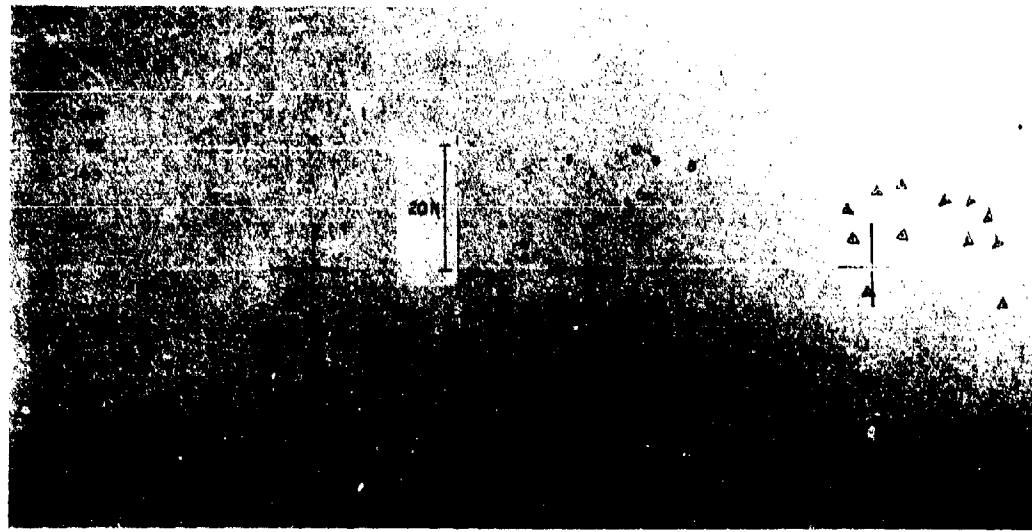


Figure 46D. Full automatic, point target, standing, Firer No. 2

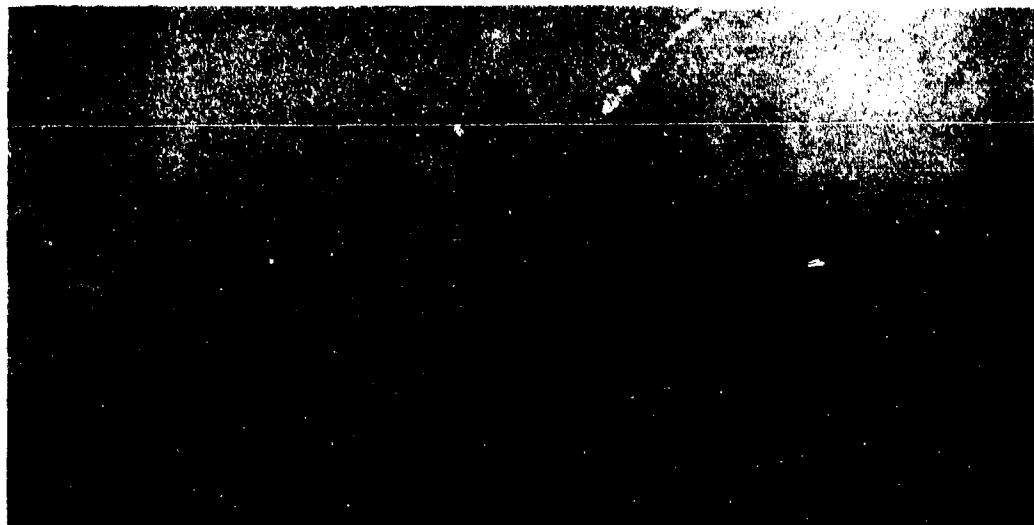


Figure 47D. Full automatic, point target, standing, Firer No. 3

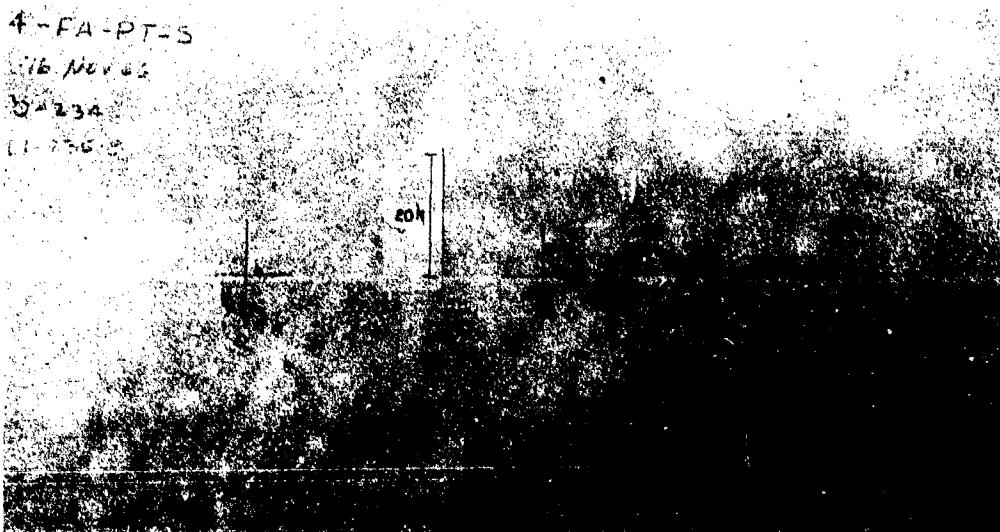
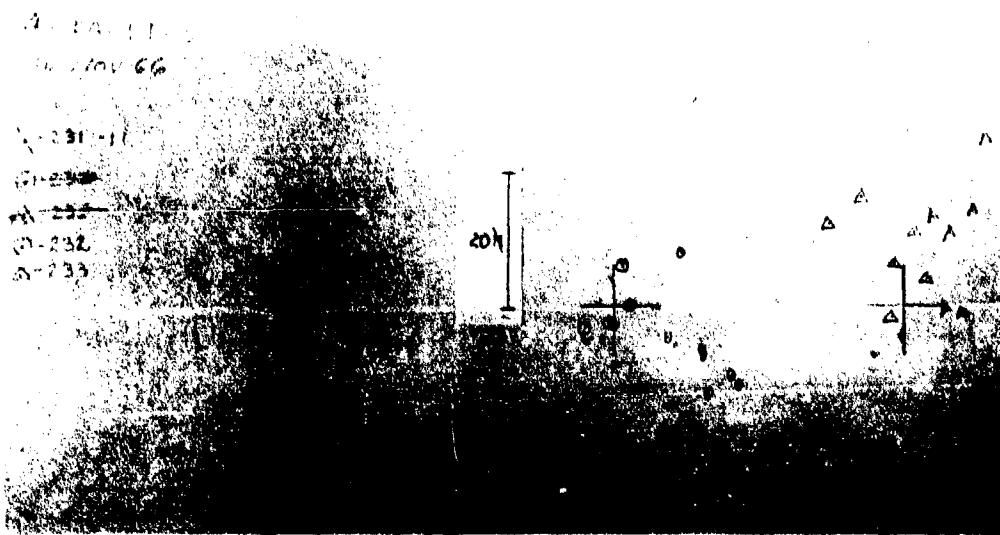


Figure 48D. Full automatic, point target, standing, Firer No. 4

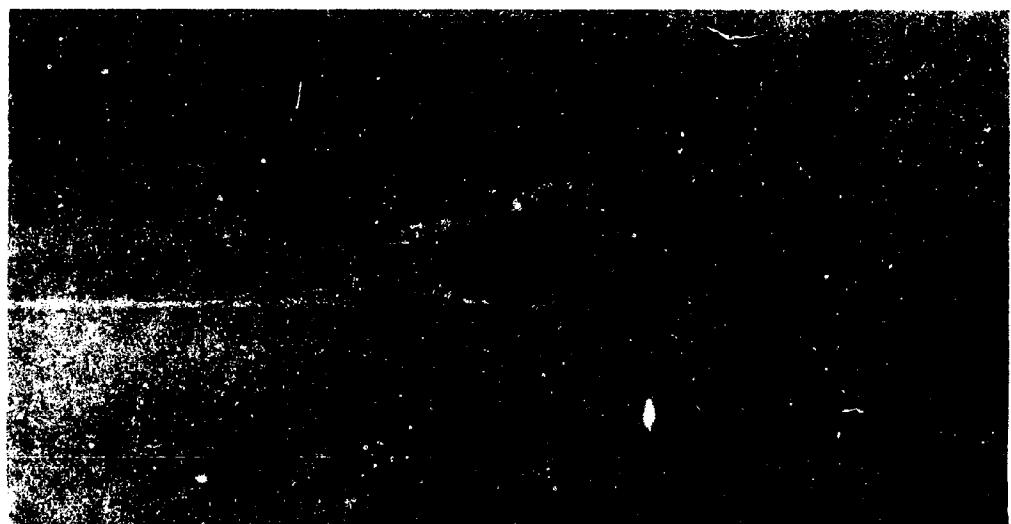


Figure 49D. Full automatic, point target, standing, Firer No. 5

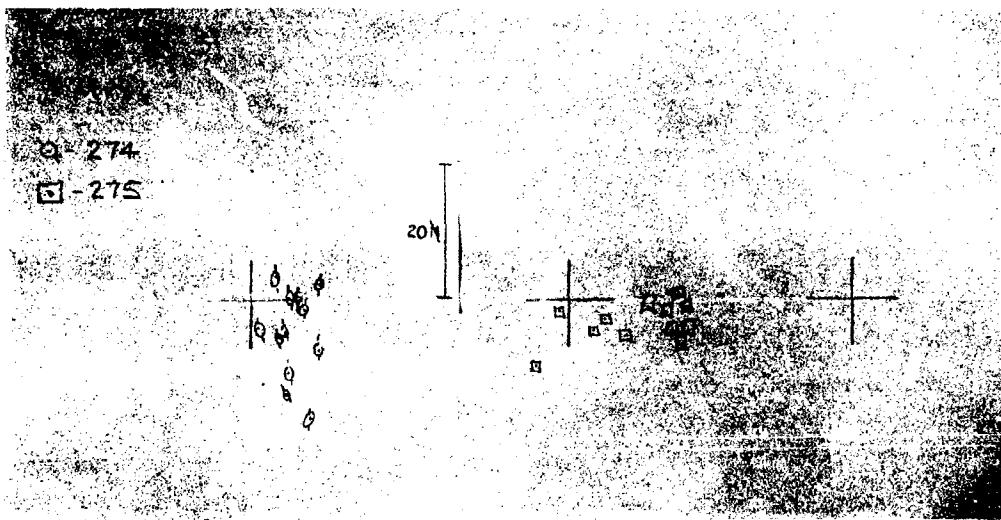
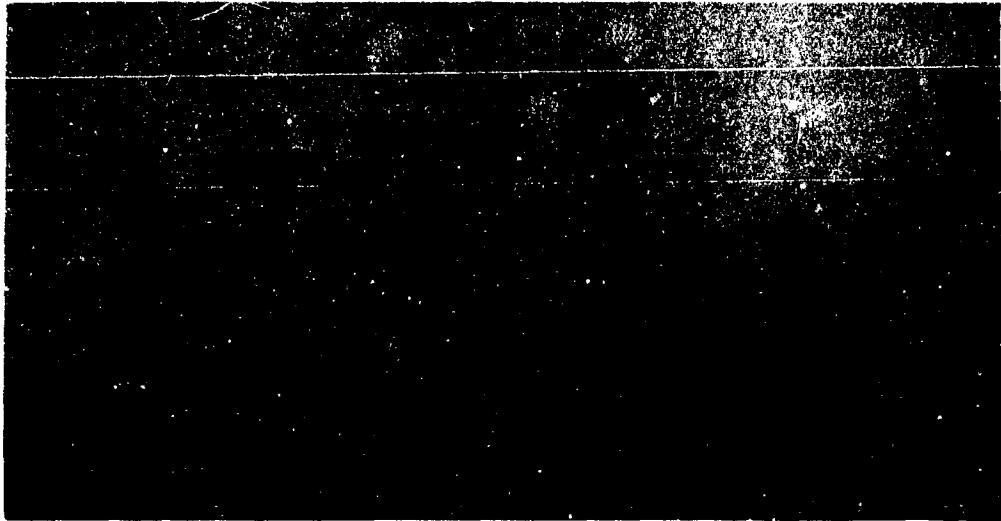


Figure 50D. Full automatic, point target, standing, Firer No. 6



Figure 51D. Full automatic, point target, standing, Firer No. 7

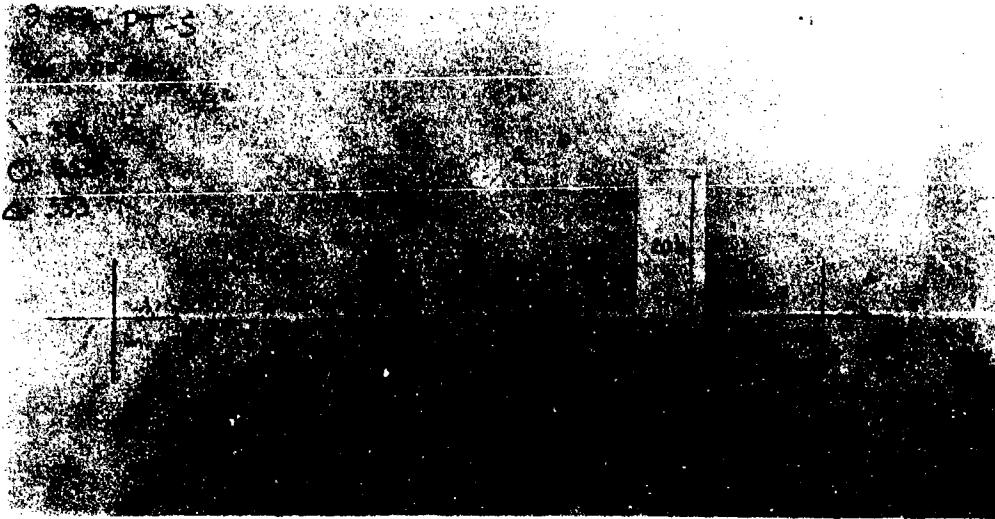


Figure 52D. Full automatic, point target, standing, Firer No. 8

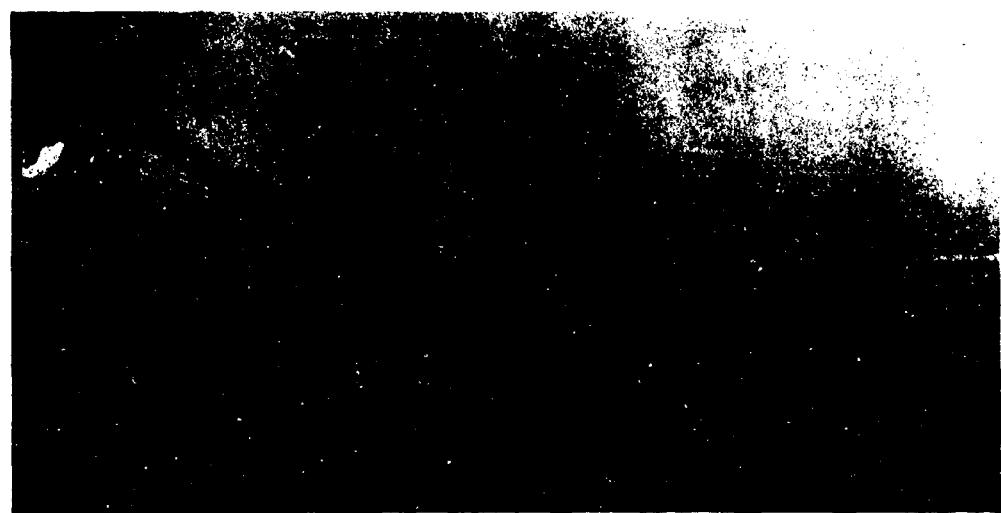
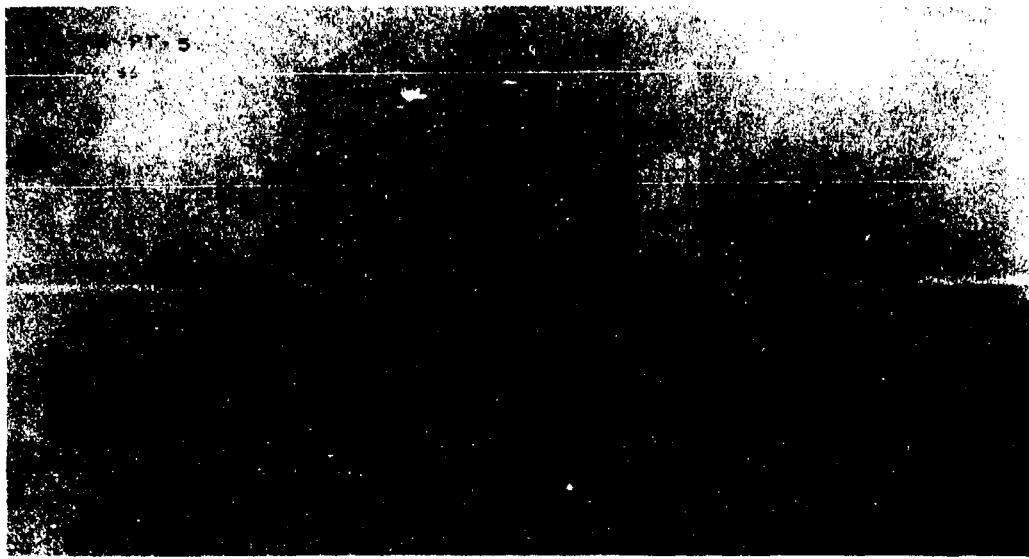


Figure 53D. Full automatic, point target, standing, Firer No. 9

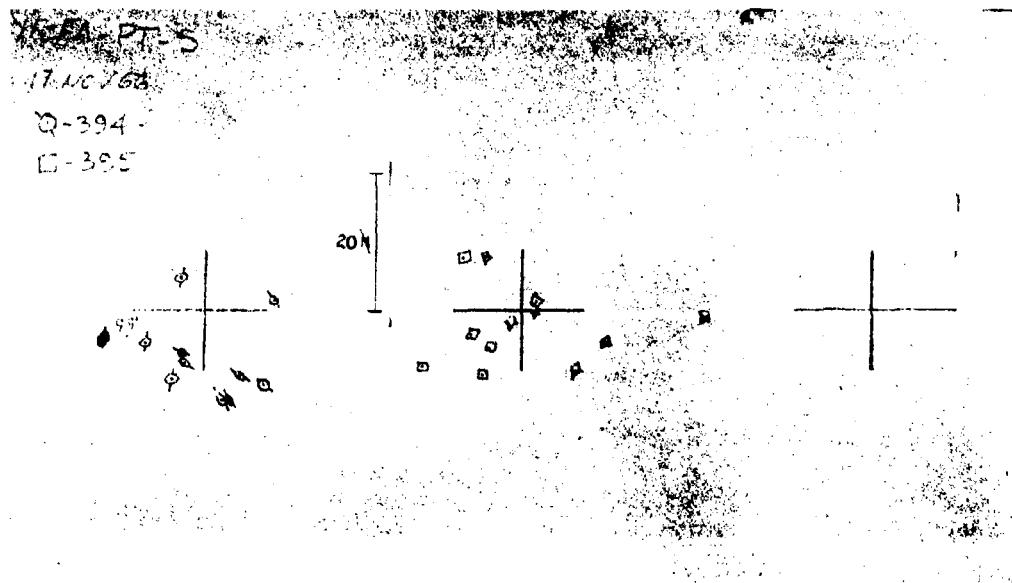


Figure 54D. Full automatic, point target, standing, Firer No. 10

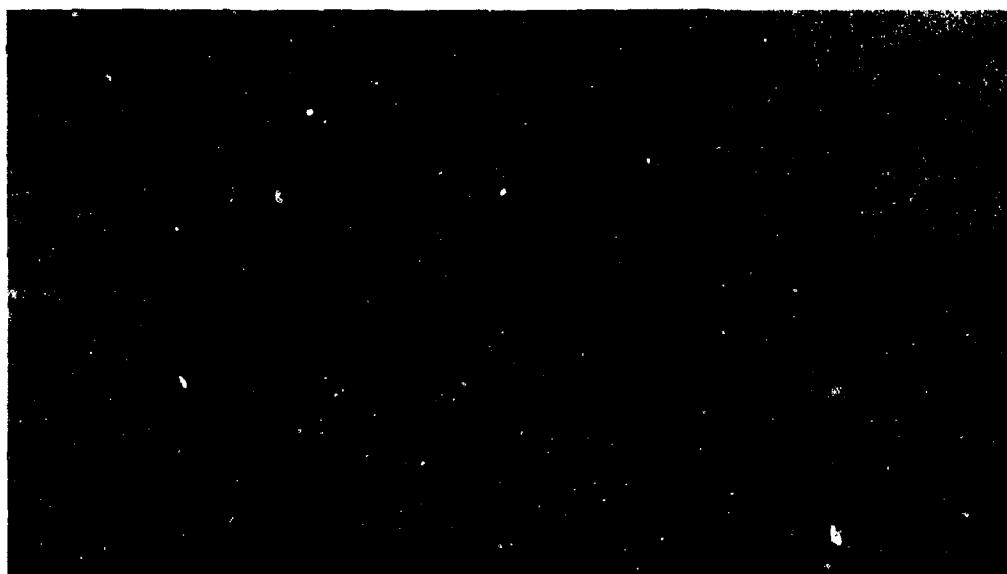


Figure 55D. Full automatic, point target, standing, Firer No. 11
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Unclassified
Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

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		2b. GROUP 4
3. REPORT TITLE SPIW MODES OF FIRE (U)		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates)		
5. AUTHOR(S) (First name, middle initial, last name) Fred W. Hall, W. Meade Werner, Emma M. Wineholt, and William W. Sheldon		
6. REPORT DATE February 1968	7a. TOTAL NO. OF PAGES 159	7b. NO. OF REFS
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10. DISTRIBUTION STATEMENT In addition to security requirements which must be met, this document is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of Commanding Officer, U.S. Army Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland.	11. SUPPLEMENTARY NOTES	
		12. SPONSORING MILITARY ACTIVITY U.S. Army Materiel Command Project Manager, Rifles Rock Island, Illinois
13. ABSTRACT A study was made to investigate the most effective mode of aimed fire to engage linear and point targets with the rifle portion of the Special Purpose Individual Weapon (SPIW) system. Basic test data were generated by a group of riflemen firing a total of approximately 23,000 rounds at different types of simulated targets on the range facilities at Fort Benning, Georgia. A supplementary phase discussed in this report is the applicability to the SPIW of doctrine evolved for full automatic fire from other rifle systems. (U)		

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
SPIW Modes of Fire Automatic Rifle Hit Capability						

Unclassified
Security Classification

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